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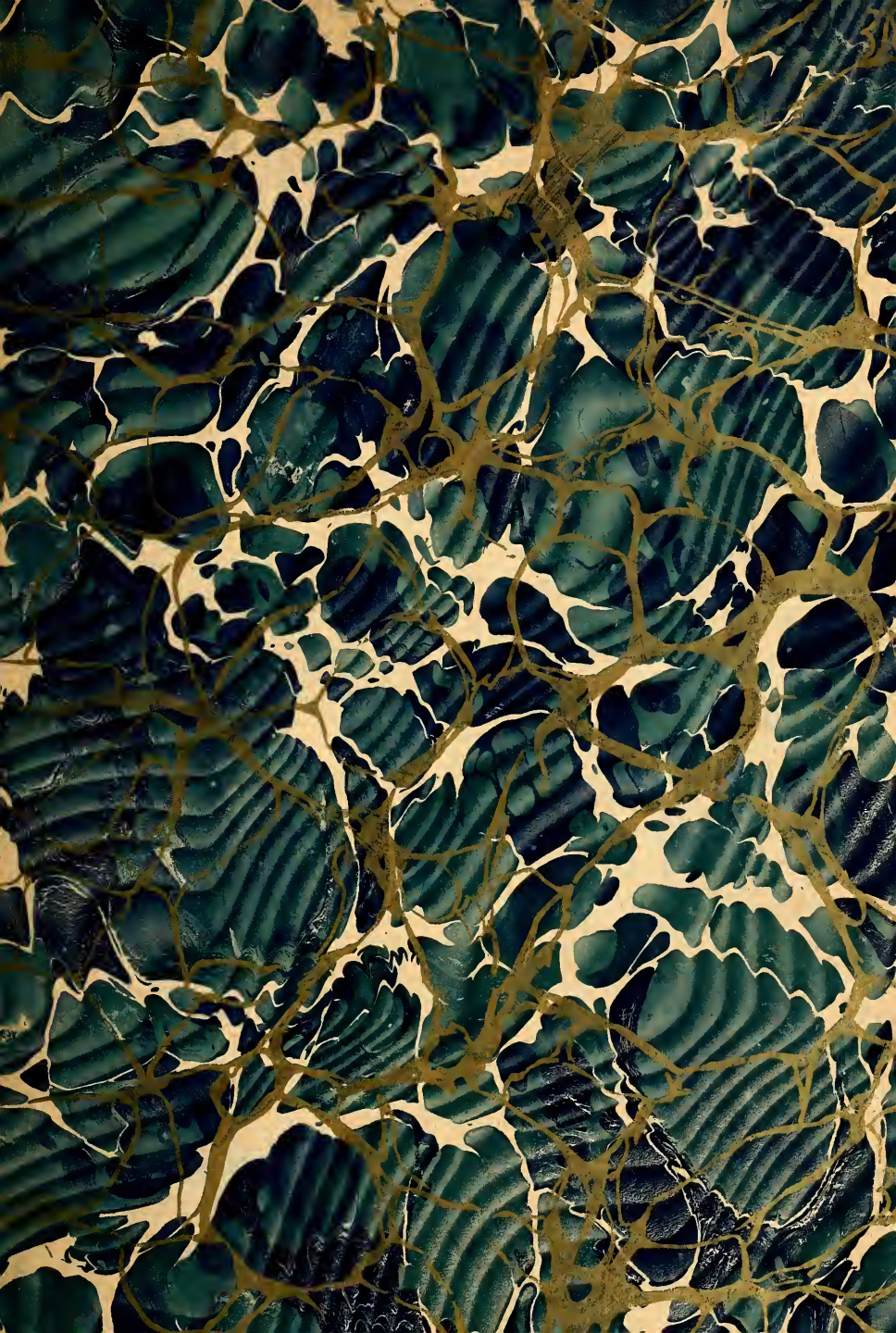

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MANUAL TRAINING MAGAZINE

EDITED BY
CHARLES A. BENNETT

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INDEX.

[Names of contributors of articles are set in SMALL CAPITALS. (A) indicates an abstract of a paper printed in the report of a meeting of an association.]

Art Basis of Manual Training (Ill.) — Walter J. Kenyon, 26.

Art, Influence of, in Relation to School and Society (A) — M. V. O'Shea, 146.

Arts and Crafts Club, An — Charles A. Bennett, 104.

Associations — American Manual Training Association, Report of New York Meeting (Ill.), 35; Boston Manual Training Club, 210; Chicago Manual Training Association, Report of Meeting, December, 1899, 98; Domestic Science Associations in Illinois, 207; Minnesota Educational Association, Report of Meeting, December, 1899, 150; National Educational Association, Report Los Angeles Meeting, 47; New England Association of Teachers of Metal-Working, 96; New York Association of Sewing Schools, 142; Northern Illinois Teachers' Association, Report of Aurora Meeting, 211; Rochester Labor Lyceum, Address of Professor Forbes before, 102; Wisconsin Educational Alliance, 100; Wisconsin Teachers' Association, Report of Meeting, December, 1899, 146.

Backward Boys — George B. Kilbon, 205

Ball, Frank H. — Special Tools for Manual Training Work (Ill.), 214; The University Elementary School (A), 39.

BENNETT, CHARLES A. — An Arts and Crafts Club, 104; Constructive Work in Elementary Schools, 180.

BRADLEY, CHARLES A. — Drawing in Manual Training Schools, 78.

Brevities — Boston, 156, 217; California, 108, 158, 218; Canada, 155; Chicago, 109, 161, 224; Colorado, 159; Connecticut, 108, 156; Illinois, 161, 223; Minnesota, 159, 219; New York City, 110, 160, 220; New York State, 219; St. Louis, 159; Washington, D. C., 108, 157.

Bryant, J. C. — The Complete High School (A), 150.

CHAMBERLAIN, ARTHUR H. — The Manual Element in the Schools of Germany, 124.

Constructive Design in Woodwork (Ill.) — W. F. Vroom, 83.

Constructive Work in Elementary Schools — Charles A. Bennett, 180; (A) Gertrude E. English, 49; (A) Robert M. Smith, 212.

Crawshaw, F. D. — Halsey's The Use of the Slide Rule, 230.

Curriculum of the Public Schools (A) — George M. Forbes, 102.

Drawing in Manual-Training Schools — Charles A. Bradley, 78.

Editorials — Changes in Names of Manual-Training Organizations, 54; Growing Interest in Manual Training, 112; Secretary Frank A. Hill, 53; Hoodlumism, 166; Manual Training in Normal Schools, 164; President T. C. Mendenhall, 226; Professor M. V. O'Shea, 113; Overcrowding the Curriculum, 227.

Edwards, Walter A. — The Manual-Training Teacher (A), 47.

EMERSON, EDWARD C. — Boston Manual-Training Club, 210.

English, Gertrude E. — Constructive Work in Elementary Schools (A), 49.

Equipment Exhibit, An — Harris W. Moore, 52.

Equipment for Manual-Training Center, 224.

Forbes, George M. — The Curriculum of the Public Schools (A), 102.

FOSTER, EDWIN W. — Leaf Forms of Our Common Broad-Leaved Trees (Ill.), 197.

Gas Stove, A. — Charles B. Howe (Ill.), 216.

Haney, Dr. James P. — Qualifications of a Teacher of Shop-Work (A), 37.

High School, The Complete (A) — J. C. Bryant, 150.

HILL, FRANK A. — The Manual-Training Idea — Reminiscences of Personal Growth into its Spirit, 1.

Howe, Charles B. — A Gas Stove (Ill.), 216.

Hubbard, Elbert — Hoodlumism, 166.

Irons, Foster H.— A Study — Manual Training for City Children (Ill.), 187.

Kedzie, Nellie Sawyer — Domestic Science Associations in Illinois, 207; Handbook of Domestic Science and Household Arts, 229.

Kendall, F. W.— Treatment of Blue-Prints, 153.

Kenyon, Walter J.— Art Basis of Manual Training, 26.

Keyes, Charles H.— Outlook for Manual Training in Secondary Schools, 117.

Kilbon, George B.— Backward Boys, 205.

Kindergarten Work at Hampton Institute (Ill.), 163.

Leaf Forms of Our Common Broad-Leaved Trees — Edwin W. Foster (Ill.), 197.

Logging in the South (Ill.) — Clinton S. Van Deusen, 93.

Manual Element in the Schools of Germany — Arthur H. Chamberlain, 124.

Manual Training — Aim of, High School (A), Charles R. Richards, 45; Art Basis of (Ill.), Walter J. Kenyon, 26; for City Children (Ill.), Foster H. Irons, 187;, Idea — Reminiscences of Personal Growth into its Spirit, Frank A. Hill 1; in the High School (A), J. E. Painter, 151; The Meaning of, in Education, John M. Tyler, 40; and Mental Development, Edward W. Scripture, 16 (see also 35); Some Aspects of, M. V. O'Shea, 59; The Teacher of (A), Walter A. Edwards, 47; Value of, as a Preliminary to Trade Instruction to the Negro, 70.

Manual-Training School, The Relation of, to the College of Engineering — T. C. Mendenhall, 173.

Mason, John H.— Wisconsin Educational Alliance, 100; Fox and Thomas' Mechanical Drawing, 230.

Mendenhall, T. C.— The Relation of the Manual-Training School to the College of Engineering, 173.

Minnesota Educational Association, Report of Meeting, December, 1899, 150.

Moore, Harris W.— An Equipment Exhibit, 52.

O'Shea, M. V.— Influence of Art in Relation to Schools and Society (A), 146; Some Aspects of Manual Training, 59.

Painter, J. E.— Manual Training in the High School (A), 151.

Pattern-Making, Outline of a Course in — Charles H. Westcott, 131.

Patterson, Jessie — The New York Association of Sewing Schools, 142.

Queries — Treatment of Blue-Prints, 153, 214; Fixing Responsibility with Reference to Tools, 153; Special Tools for Manual-Training Work (Ill.), 214.

Reviews — American Schools of Mechanical Technology, 116; Hough's American Woods, Part I, 170; Course of Study, Manual-Training Department of the Elementary Public Schools, Chicago, 1899–1900, 169; Drawing in Four Foreign Cities, 57; The Economic Aspect of Manual Training, 116; Educational Aspects of Manual Training, 231; Elementary School Record, 230; Handbook of Domestic Science and Household Arts, 229; Illustrations of Drawing and Shop-Work, 58; Manual-Training Courses, 58; Tompkin's Philosophy of Teaching, 168; Manning's Planning and Planting Home Grounds, 169; Frederick's Plaster Casts and How They are Made, 169; Fox and Thomas' Practical Course in Mechanical Drawing, 230; Pinchot's Primer of Forestry, Part I, 115; Report of the Principal of Hampton Institute, 57; Scripture's Studies from the Yale Psychological Laboratory, Vol. VI, 115; Halsey's The Use of the Slide Rule, 230; Western Drawing Teachers' Association, Report of, 171.

Richards, Charles R.— Aim of Manual-Training High School (A), 45.

Rogers, Frank K.— Value of Manual Training as a Preliminary to Trade Instruction to the Negro, 70.

Scripture, Edward W.— Manual Training and Mental Development, 16.

Sisson, E. O.— Tompkins' Philosophy of Teaching, 168.

Smith, Robert M.— Constructive Work in Elementary Schools (A), 212.

Sweet, Allan K.— The New England Association of Teachers of Metal-Working, 96.

Teacher of Shop-Work, Qualifications of a (A), James P. Haney, 37.

Tyler, James M.— The Meaning of Manual Training in Education (A), 40.

University Elementary School, The (A), Frank H. Ball, 39.

Van Deusen, Clinton S.— Logging in the South (Ill.), 93; Pinchot's Primer of Forestry, 115.

Vroom, William F.— Constructive Design in Woodwork (Ill.), 83; Report of New York Meeting of American Manual Training Association (Ill.), 35.

Wesson, Walter G.— Fixing Responsibility with Reference to Tools, 153.

Westcott, Charles H.— Outline of Course in Pattern-Making (Ill.), 131.

Wisconsin Teachers' Association, Report of Meeting, December, 1899, 146.

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VOLUME I NUMBER 1

MANUAL TRAINING MAGAZINE

OCTOBER 1899

THE MANUAL TRAINING IDEA,—REMINISCENCES OF PERSONAL GROWTH INTO ITS SPIRIT.

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Secretary of the Massachusetts Board of Education.

IT is treacherous business for one to trace the growth of one's own thought on an important theme. I venture to brave the pitfalls, however, in the case of my views about manual training, partly because I can conveniently illustrate in this way how teachers may unconsciously pay fragmentary tribute to the philosophy of manual training before they know what it is, and partly because the story of my own groping for light may lead a teacher here and there to get into the sunshine a little more promptly than might otherwise be feasible for him.

I recall that when I began to teach in 1858 — it was during the long winter vacation of my freshman year at Bowdoin — I sometimes heard it said that it would be a good thing if boys could be taught the use of tools in school. I regarded the notion at the time as a visionary one. The school had no business with tools; they belonged to the home, to the period of apprenticeship, to the workshop. It would be the wildest extravagance for the schools to take them up. What tools should they teach? What trades should take precedence? What should be done with the girls meanwhile? Does education lie that way? Then I said, "The hard-headed public gives it no thought. Why should I?" And so in this summary, self-satisfactory way, I put the matter aside as a harmless speculation.

I had a feeling, however, at the very beginning of my teaching that it profited a pupil, not simply to read or to hear how a thing is done, but to see it done; nay, when conditions should permit, which I thought

they seldom did in the schools of the times, to do it himself. There was my high-school chemistry, — Comstock's chemistry. I studied it under a good teacher, but I neither performed, nor saw performed, a chemical experiment while I was in the class. Pictures of apparatus and descriptions of processes had to satisfy me. It was in college that I saw chemical experiments for the first time, to my great delight and profit, but I had no hand in them. Indeed, I cannot recall that I did in any manual way a single piece of scientific work, outside of the analysis of plants, during my entire college course. When, as a teacher, I tried a few chemical experiments before my class, I did so because they interested me and I thought they would interest my pupils ; they helped me and I thought they would help them. As I slowly worked them up, without previous experience in the work, I became conscious of a clarification of my knowledge, of an increased grip upon my subject, and often remarked, "Surely the best way to learn a subject is to try to teach it."

I see now, better than I did then, that I was really getting the lion's share of the profit. I had a kind of pleasure in doing such things for my pupils, and there was a further incentive in the evident pleasure of my pupils in seeing what I did. I did not know it at the time, but as I look back I realize that I must have worked in a spirit more selfish than altruistic. I prized the exhilaration in self that comes from showing novel things to others rather more than the exhilaration in others that comes from finding things out for themselves. At any rate, I did not so much ask my pupils to observe for themselves as I sought to have them see what I saw, and hear what I had to say. I was the active one ; they were the passive. Had any one said to me at this time, "Now what you are doing yourself for your pupils is just what they ought to be doing themselves," I might have assented to the suggestion as ideally a good one, but I certainly would have scouted it as impracticable. The schoolhouse where I taught was not adapted to such work ; the committee had no money for it ; the public would not stand the expense of it ; pupils would cut, burn and poison themselves in doing it ; parents could not see the sense of it, and would not tolerate the thought of it ; I had no time to give to it ; it was all I could do to keep my head above water with my own humble undertakings. I presume, however, it was not the result of any conscious decision on my part that I did not, as a matter of fact, stir up a hornet's nest of protests in the matter, but simply held my peace and kept on doing experiments in a desultory way, as I had begun.

There was a field, however, in which I could arrange for individual work involving the use of the hands and the senses and the bodily activities, — laboratories of nature's own, close at hand, no apparatus needed except a knife and a lens, the material for manipulation abundant, luxuriant, beautiful, wonderful, and graded to every capacity. I have no recollection of working in that field during my primary and grammar-school days. It seemed to have been a heresy to study plants in the lower schools that I attended. I do not blame my teachers for it ; I blame the times rather. Nay, I think the times may be pardoned, very much as an apple may be excused for not being ripe. I shall never cease to be grateful, however, that, when I entered the high school in Biddeford, Maine, at the impressible age of eleven, I came under a teacher, who, though he taught oxygen without making the gas, could never be charged with teaching botany without plants in hand or geology without the earth as a witness. He was a lover of nature of the outdoor type, and there was contagion in his love. The arethusa in the bog, the glacier's trail over the ledge, the dike of trap in the quarry ; such things I came to know early and soon became curious about. My study was crude and boyish enough, but there was passion in it all, a tithe of which would stand me in stead in many an enterprise today. Perhaps I ought to have been more scientific about it, to have begun with the cell and worked up to the plant, or with the plant and worked down to the cell. Either of these ways is sound after its fashion and honors are easy between them. But I did nothing of the sort. I was delighted if I hunted a plant down to its name in the book or a plant that was only a name to me down to its lair in the woods. I know the joy of wading knee-deep in the swamp and seeing for the first time an orchid that up to that supreme moment had successfully eluded me. I know the joy of finding the white pontederia, when the botanies all said blue, and of receiving a letter from dear old Asa Gray, thanking me for specimens, but saying that he had ceased to be astonished at such pranks of color since he had seen the white cardinal flower. And I know that nature has seemed richer and friendlier to me all my life because of these my early rompings with her. There are a thousand ways to approach her, no doubt, and some of them are royal, but the crookedest bypath is not without its picturesque interest. Know her thoroughly ? I would not know her through and through for the world, her mystery solved, her charm gone, her resources a squeezed and abandoned orange. To range from the heart of things to the outermost boundary, exhausting it all — that's the end

of growth and the death of interest. Heaven would cease to be heaven if it meant the end of revelation, the upward soaring forever barred, the beyond an everlasting blank.

I was not wholly unprepared, then, when I came to botany, geology and astronomy — for these were among the ten or fifteen subjects that I had to teach in my callow years, on the theory, probably, that the less one knew about them the more of them one could handle — to fall into laboratory methods such as they were, to set the boys and girls at work on the plants and the rocks about them, and the constellations above. It was all done empirically, done because, as a pupil, I had done it and thought well of it, done without much thought of the psychology of the doing, but done, it may be added, in a half unconscious deference to deep principles, whose clear recognition and formulation belonged to a later stage in my development.

The value of such methods was so obvious that it soon became a question with me how to extend them to physics and chemistry. Specially equipped laboratories were desirable; they had begun to appear in favored spots. I recall that in the late sixties I once visited a chemical laboratory in the new and elegant Cambridge High School building of the time and was deeply impressed by it, although twenty years later, when I became principal there, I chafed under its basement conditions and inferior appointments, and not long afterwards was favored with a better laboratory in a grander building. To fold one's arms, however, and wait until the people should provide suitable laboratories meant that class after class would have to leave school with huge and needless gaps in their scientific instruction.

It was during this stage of waiting for something better that two trends in my teaching of chemistry and physics came to be a little more sharply defined. I talked less, for one of them, and tried to have the pupils do more for themselves, for the other. That is to say, it became a controlling conviction with me — it had once been but little more than a form of words — that it was the pupils more than the teacher that must do the seeing and the thinking and the telling, even though conditions forbade their doing the doing. The less the teacher stood in their way with his premature and exasperating telling of things, the more of joy they would have in discovering them for themselves and the greater incentive to press further any advantages thus gained. Although I kept on in the old way of doing the illustrative and experimental work myself for my pupils, I insisted more and more on their noting conditions and results and giving their own

interpretations of it all; and my charity in the presence of blundering views grew the larger the more clearly I saw how important it was not to dampen the ardor of genuine thinking by making light of its vagaries. There was gain here, but something lacking after all, which I tried to atone for by encouraging the doing of outside work, largely experimental, in a voluntary way. There was a value for the pupils in such individual manipulation and consequent enlistment of the executive and observing powers not otherwise attainable; moreover, there were marked variations of capacity among them that were thus a little better met.

We sometimes flatter ourselves that we have solved the problem of grading our pupils. The fact, however, is that the only grading we are sure of — if we are sure of anything — is that of facilities offered, of opportunities enjoyed; the absolute marching abreast of pupils intellectually, morally, socially, esthetically, is an impossibility. If there seems to be such evenness of movement, as when they are all marked 100 per cent. in an arithmetic test, it is only because the test has been limited to some tiny drill field in the mental glebe. The drill is capital, the product is excellent, the child is ready for the next step; but to attach to so scant premises the mighty conclusion of an even class advance with unbroken front all along the lines of individual development is, of course, illogical and preposterous.

I long ago became skeptical about the claims of the average pupil. Who is this average pupil? Here are two boys, one five years old and the other fifteen. Their average age is ten, of course, but it should be noted that there is nobody of that age in the flesh, for each of the two is five years removed from ten, and there is no third in my illustration. But ages are simple and similar things that admit of being averaged, so that your pupil of average age, though often a myth, is a living possibility after all. Not so your pupil of average capacity. He is an unintended but none the less an unmitigated fraud, the supposed result of impossible processes. Average, if you can, A's power in music with his stupidity in mathematics and the result thereof with B's power of imagery or keenness of conscience or what not. Percentages supposed to stand for such things can be averaged, but I refer to the things themselves. Even should you fancy you have somehow correctly gauged this pupil of average capacity, what can you do about it? The task that might conceivably fit him is too easy for all above him; too hard for all below him; that is to say, it is a misfit for the class. Assigned exercises that come within the reach of all are adapted

to minimum capacity rather than the mean and leave alarming margins of higher capacity unprovided for.

The more I weighed the matter, the stronger my conviction grew that, between the talking teacher and the passive class, the adjustments of instruction to personal needs were about as bad as they could be. And yet what is the school for, if not to bring about such adjustments? What right has the school to limit its attention to some average-capacity pupil, fictitious or real, whose shifting place in the class nobody knows until bright ones above and dull ones below are duly weighed, summed up and divided into equal portions, of which one is the mean to be taught? I have had my share in the percentage business. I have always believed, and still believe, that percentages are a brief, time-saving, comprehensible way of expressing opinions about certain examinable results of study, but there came at length a time when my conscience compelled me to keep a standing notice before parents and pupils in which I tried to distinguish between the narrow permissible field for their use and the broad non-permissible one.

Resuming my main thought, I have to say that I became early convinced that it is only as the pupil becomes personally active under teaching that inspires him to do for himself, that coarse adjustments to his capacity are attainable and fine ones possible. Now the voluntary work which I succeeded in getting was important because it allured pupils to work more nearly up to the level of their capacity. What waste, what mischief there is in the dawdling along of pupils who do not use half their power? It was also important because by means of it pupils in their mental processes were more likely to make those connections of one thing with another which are so favorable to the comprehension and retention of what is done. How many difficulties vanish in teaching when the knack comes of getting the pupil to connect new things he ought to understand with old things he has already found out and knows he knows. Such a process is forever going on, in a happy-go-lucky way, as the child knocks about among his playmates—a process wild and partial enough, and sometimes questionable, but of precious and picturesque aspects withal. To capture this process for the schools, to use it educationally there, to guide the child's activity with due deference to his bent and his freedom—therein lies the art of successful teaching. What the child gets by a judicious conjunction of physical activity and mental is doubly clinched in his mind. He gets it through his sensory apparatus, he gets it through his motor, each

reinforcing the other. It is the best of all ways of developing those oases of the mind that are learnedly called apperceptive centers. I had always known, in a way, that the true order of procedure in the child's mental growth was from the known to the unknown, from what is to what is beyond, from the concrete to the abstract, from the simple to the complex; but the uncompromising obstinacy of the principle, express it as one will, the utter impossibility of a child's learning a new thing that is absolutely unrelated to any old material in his mind, the profound significance of Christ's saying, as true of the mind with its powers as of the servant with his talents, that "unto him that hath shall be given," it took me many years to rise to, and I am not sure yet that I am sufficiently possessed of it and by it to be absolutely and always true to it.

In these voluntary exercises I found a stronger evidence than I expected of the remarkable differences not only in the capacities of different pupils, but in those of the same mind. At the moment of writing, I am thinking of a boy who once brought me, as a voluntary exercise, a refracting telescope made wholly by himself, even to the screw threads and the grinding of the lenses. Later, I had occasion to plead for him with the authorities of a high scientific institution, who hesitated to receive him on account of his poor English. "He cannot spell telescope," I said, "but he can make one, and show the rings of Saturn with it," whereupon they consented to give him a trial.

Another reason for commending voluntary work to pupils must not be overlooked. The true educative process is a self-activity process. The sooner the child gets to doing educative things, not because the teacher requires them, but because he himself wants to do them, the brighter the promise for his mental growth. That is a questionable scholarly spirit that never gets beyond the set task. There is a profound sense in which no school ever made a scholar or ever will. If, when school ends for good, study also ends for good, there is a lamentable miscarriage in that noblest purpose of the school—the inspiration of the subsequent life.

When laboratories for physics and chemistry came my way at last, my personal teaching of these subjects had come to an end. As an interested on-looker, however, I saw that, while some of the old problems were in process of solution, some new ones had become threatening. Just as in the kindergarten it is possible to miss the kindergarten spirit, to go through, for instance, the motions of formal exercises in

the outskirts of the Froebelian idea while a thousand leagues from the heart of it, so in the laboratory it is possible to miss the best laboratory spirit. I do not like, for instance, to see a laboratory for youth intent on a few isolated and typical experiments and nothing else. The intensive, time-consuming drill of personal experimentation is invaluable, but breadth is needed. The drill builds up grand apperception centers, but these centers need exercise. Nay, the supreme argument for the drill is that, though narrow in itself, it favors ultimate breadth. Chance accretions to these centers are not to be lightly spoken of, but a beginning, at least, in their systematic enrichment, should be made in school. Now is the right time to witness experiments by the teacher, to study them in books, to read scientific writings, to observe scientific processes in the industrial world. It is only as these centers grow in variety and luxuriance, that the avenues of access to the pupil's mind from outside are multiplied. But now a new danger confronts the talking teacher. If less likely to tell new things to minds not prepared to receive them, he is more likely to tell old things to minds that have come to know them.

Manual training came into my field, not in the slow, insinuating way of the laboratory, but suddenly, in a large way, with wealth and enthusiasm behind it. Among the munificent gifts by Frederick H. Rindge to his native city of Cambridge was that of an elaborate manual-training school. It was founded for the boys of the English High School, of which I was principal at the time. On the shop and drawing side, the school was private; on the academic side, public. I was ready at the start to look upon it as a most natural and defensible extension of the laboratory idea from physics and chemistry to the constructive processes and principles of industrial life. The propositions already formulated to justify the laboratory idea admirably fitted this latest and boldest phase of it, but by no means exhausted its defensive possibilities.

The utility, in particular, of the new phase impressed me. Here are the visible, tangible, and endlessly varied witnesses on every hand of the constructive spirit of this busy world—houses, workshops, and machines; canals, railroads, and boulevards; palace cars, traffic fleets, and mighty navies; Atlantic cables, Suez canals, and Brooklyn bridges; vast public and private enterprises that have enlisted every grade of human energy and skill, from the nameless shoveler of dirt up to Michael Angelo. Why should not a system of education hold some close and carefully thought-out relation to important sections of the

world's constructive activity like these as to those other sections where law, medicine, scientific attainment, and literary culture play each its active part? Then there is the boy who must work for a living. Should not a part of his training, at least, recognize more fully than in the past the primal law that by the sweat of his brow he must earn his bread? Moreover, in the intense rivalries of our modern industrial life, it began to be obvious that communities needed to bestir themselves to maintain their industrial efficiency if they had it, or to build it up if they lacked it. And when one visits a great fair, like the Columbian at Chicago, and notes to the verge of bewilderment the ingenious usefulness, the astonishing wealth and the enchanting beauty of what the mind and the hand can conjointly do, the conviction no longer can be kept back that a scheme of education that does not directly provide for the training of the constructive and executive powers, nay, that may divert the mind from such training and even unfit the mind to receive it, is seriously defective.

There were many educated people, however, able friends of the schools, so trained in the old humanities, and so imbued with their spirit, that they could not be much impressed by views like the foregoing. They dreaded the taint of commercialism or materialism in the schools. To adapt courses of study to the demands of sordid, money-making times, was a lowering of the high spiritual ideals which the schools should uphold. To urge upon such people the utility of an educative process was practically to doom it for educative purposes.

It was to meet this skepticism about manual training, that I found myself struggling to see a little more clearly, if I could, those intellectual and spiritual values which I felt it had. The utility existed; it was obvious; it early won the approval of those who are not accustomed to see much more in school than that somehow it helps a boy to "get on in the world." In presenting, therefore, the claims of manual training for a place in the school, it did not seem necessary—it was not good strategy—to waste much time on its mere utility when everybody admitted it. It was of more consequence to point out those higher values that people are not inclined, at first, to associate with manual training at all.

Thus it was that I found myself early distinguishing between that training of the hand to a single process that exalts the automaton and that other training of the hand to diversified and progressive exercises that keeps the mind alert and does not let up. The workman's skill, made sure and easy by habit, means swifter and better production by

him, and, therefore, more pay. Moreover, this storage of skill in the form of habit frees his mind for new acquisitions in his trade or new possibilities outside of it. Still, in a scheme of education, the pushing of a process until it goes on with precision without the intervention of will is hazardous in that, as its industrial value tends to increase, its educational value tends to reduce. Just here is where the factory educationally fails. It cares more for the process than for the boy. It wants a thing done in the cheapest, quickest, and best way possible. This means dividing the manufacture into a score of processes, to one of which it assigns the boy. When he can do his work with his eyes shut, as a woman her knitting, the factory's interest in him has culminated. If he forever remained a boy, doing his tiny fraction as a machine, nothing would suit the factory better. But how dwarfing and stupefying it all is,— the higher values of the process extracted at the outset, no more of them in sight to quicken the soul, the work-life plodding on through the dull years, unrelieved and dreary, the doer sacrificed to the monotonous thing he does! It means daily bread for the body, but how about life outside of the humdrum, the neglected areas of the brain, the daily bread of the soul? It is right here, in this unutilized realm of vast possibilities, that the manual-training school leaves the factory as an educational agency hopelessly behind. The boy is now the supreme thing, not something to be made and sold. One process mastered in principle and fairly fixed in practice, the next is taken up, and the next, for, although it is surprising to how few typical tools and processes the endless operations of constructive industry can be reduced, there are many to be learned, and life is short. Always the thought is present that the intellectual value of processes is exhausted before commercial success therein is assured. And always there is active that best and most natural of all correlation — the application of scientific principle with its theoretical study, each reinforcing, illuminating, and permanently fixing the other.

Falling into this way of thinking, I could not well avoid the conclusion that the trade school proper either has no place in an ideal public school system, or, if a place, then only at the top. Like other highly specialized schools, it presupposes a basis of general training below. The doctrine of electives is abused when it permits any choice of studies to the exclusion of the foundations on which they rest. The trade school should not, therefore, precede the manual-training school, nor compete with it, nor serve as a substitute for it, but should follow it. In the last year of a high manual-training school, for

instance, the pupils might legitimately specialize for the conquest of specific trades. The place of the trade school in philanthropy is a matter for separate consideration.

To sum up, the three agencies of the factory, the trade school and the manual-training school, when ranged in a row for inspection, began to look in my thought somewhat as follows :

The factory is intent on some finished product. It lets the boy slide as soon as he gets to contributing his mite to that product.

The trade school takes up the boy himself and trains him to the various processes of a single occupation ; it is intent on making him master of that occupation. The utility of the factory is here, and much beside.

The manual-training school generalizes numerous occupations. It trains the boy in their common elements. It is intent on making the most of the boy on his executive side as well as on his reflective. Doing without thinking, thinking without doing, the one soulless and mercenary, the other barren and profitless — these are the Scylla and Charybdis on either of which one's education may go to wreck. Nature puts the doing and the thinking together ; the manual-training school aims to keep them together. It has enough of the utility of the factory and the trade school to brighten the prospects of a livelihood, but in all else it rises immeasurably above them.

Passing to later phases of my attitude towards manual training, I have come to feel, in common with many of its advocates, the poverty of its chief descriptive epithet. The word *manual* is too suggestive of the merely external, physical aspects of the training ; it stops with the hand ; its primary meaning is exhausted in covering the deftness of that organ ; it does not recognize the mental elements in the case ; the narrow name gives no hint of the profound typical nature of the training, for there is no genuine education that does not literally involve physical activity of some sort in habitual forms. These forms may be exterior or interior, visible or invisible, easy to follow or baffling in the extreme, but whatever their open or hidden, their positive or negative nature, they are the inseparable attendants of educative training. Indeed, the philosophy of the matter has so widened and deepened that the processes we still continue to include under the petty word *manual* have hopelessly outgrown more ambitious epithets. There is *motor* education, but the word is still too scant ; the soul is not there. *Manumental* links the hand and the mind, indeed, but people do not take to the coinage. Dr. Henderson would

call the training *organic*, as, indeed, it is, but the only difference after all between *manual* and *organic* is one of quantity rather than quality — one word covering one organ and the other all organs. We might as well admit that we are in the presence of a thought too vast to be named with a single epithet, the fundamental thought that all our sensations, emotions, thoughts are dynamic, that they tend to discharge themselves in action, that the energy of this action, like any other energy, may be dissipated in infinitesimal rills, or gathered up, concentrated and made potent in execution, that the varied expressions of this energy react on the mental states from which they spring, intensifying or otherwise variously modifying them, that some of the activities so stimulated make for welfare and need to be fixed in habit, while others make against welfare and need to be repressed in habit, and that only those processes of school are truly educative that favor the fixing in one case and the repression in the other. As Baldwin puts it, "Every mental state is a complex of sensory and motor elements, and any influence which strengthens the one tends to strengthen the other also." Whatever the modifications of nerve force on the physical side or of soul force on the mental, a parallelism between them on rising or falling planes seems to be forever kept up through endless reactions, every reaction material at one end and spiritual at the other, the mystery insoluble but the fact irresistible. Education now becomes larger than the schools; it coincides with life in its totality. It depends on stimuli from without and responses from within, the world setting the copy and the child imitating it, suggestions from the one ending in action by the other, the copy enlarging and the imitation merging in the higher processes of the mind. Always it is self-activity — in the young largely of the outward and visible sort — the joint product of the stimulus and the response. The question of school or no school is simply a question of taking pains or no pains with the stimuli to which the child should respond, and the methods of that response. Some drift among the haphazard stimuli about him is inevitable, but the well-chosen and sturdily applied stimuli of a good school are mighty against the accidents of the drift. Without this painstaking, the masses are illiterate, unoriginal, and narrow, ill fitted by speech, or example, or great thoughts, or progressiveness of any kind to furnish stimuli that tell.

The distinctions we make between the real and the nominal, the true and the false, belong to the schools as to many things else. There are schools in reality and schools in name only, with all degrees

between. We need a new word, some antonym for school, that shall properly name the worst type. I read in the *Popular Science Monthly* some years ago an article on the artificial production of stupidity in school. The product is a feasible and not uncommon one. Ever since its possibility dawned upon me it has been my *bête noir* as a teacher. The process has its philosophy, such as it is, best seen in the light of that opposite philosophy which underlies the natural production of intelligence.

Observe a well-taught manual-training class — a class of forty or fifty boys in woodworking, for instance, such as I have often seen in the Mechanic Arts High School of Boston, under Mr. Eddy. The model exercise has been given and explained. The boys follow it intently, for they are to reproduce it. Thereafter the teacher folds his arms while the boys saw and plane and chisel the lesson into the very substance of their being, doing it all in the most approved psychological way without knowing it. Or if the teacher drops a word of caution here, shows the handling of a tool there, or brings out the reason of a process somewhere else, it is all done so quietly, easily, comfortably, that shallow on-lookers might query whether he is earning his salary or not. The fact is that he is more than earning it, because of his superb success with that highest of the teacher's functions — the vitally essential one of keeping all his pupils continuously and effectively at work. The manual-training school, with its special equipment, lends itself happily to this result, but its philosophy is for every school, and for none more than the school for little children. The unequipped and barren schoolroom, bricks to be made without straw, the teacher impotent to make them if he had straw, fifty children with unharnessed energy running wild — here are conditions at the antipodes; it is a marvel that any school survives them. Artificial stupidity — that is not the worst of it, for artificial deviltry is there, and often artificial cruelty as well, blindly struggling to crush it. Horace Mann reported that when he began his supervision of the Massachusetts schools, some sixty years ago, from three hundred to four hundred schools a year were broken up — totally wrecked, out of sheer incapacity in their pilots. The same ratio would now give us fifteen hundred wrecks a year. Happily the days for total wrecks are over with us, thanks to improving views of the educative process, but partial wrecks here and there are still in evidence.

I do not withhold from the traditional school my mite of tribute to its worth. I am deeply grateful for the good it did me as a pupil,

and, in view of my experience in it as a teacher, not disposed to be unduly critical of its shortcomings. It has done, and is still doing, a work for the pupil and the state whose value cannot easily be set too high. That it has done so well is due, in part, to the saving grace of the pupil's life of physical activity without the school and of the teacher's conviction that somehow that life of physical activity has high educative possibilities, of which use should be made within the school, if never so sporadic and humble.

Still, it remains true that the traditional school is of too sedentary, bookish, and inert a type ; that it works too exclusively on form-subjects, too little on thought-and-action provoking themes ; that it is not sufficiently alive to the principle that the forms of things are externals merely, of value only as they clothe the substance of things, and that they are best dealt with when there are real thoughts and actions for them to be fitted to ; that its discipline is too repressive ; that it leaves out of view large tracts of the mind as if they were a wilderness of no present or prospective value ; and that, if it recognizes the philosophy of learning by doing, it restricts it unduly to what the mind does through interior processes only, to the neglect and detriment of the larger executive nature.

I find myself impelled to think, as the outcome of my experience, that that is the best school whose conditions are most favorable for the exercise of the child's native activities ; that that is the best teacher who is the most discreet guide of these activities, and these activities are at their best when they lead from play up to work, from instinct to reason, from interest to will, from reliance on others to reliance on self, from selfishness to altruism — in short, from one's lower, uneducated, natural self to one's higher, educated, ideal self.

In some such spirit as this the modern school should be conducted. The child's ideas demand it, since ideas gained through outward activity have a clearness, a definiteness, an abiding character impossible from pouring in or telling processes. His habits demand it, for good habits are nothing else than the child's expression of himself in commendable action. His character demands it, for good character is but another name for the right exercise of the will, and will expresses itself invariably in action of some sort, exterior or interior, and in the child largely exterior. In brief, the whole executive side of his nature demands that the active, irrepressible child, forever impelled by sights and sounds and the consequent feelings and ideas that well up into his responsive life to do things, shall have a suitable field for the

utilization of his abundant energy and a competent guide to give it an upward turn and an improving value. To sensible guidance of this outward doing the inner life tends to respond, and in due time there are intellectual and spiritual fields of fair dimensions for occupancy and enjoyment; and all without impairment, but with a strengthening rather, of its capacity to do things in a world where things must be done well or the doer must go to the wall. The theory of it all is not one of dissipation and effeminacy, or of what some call soft pedagogics, but one of concentration and sturdiness rather, the teacher at the helm, indeed, but the pupil always at the laboring oar. "The most colossal improvement which recent years have seen in secondary education," says Professor James, "lies in the introduction of the manual-training schools." He might have added — his admirable psychology would support him at every point — that a grander improvement still would be the recognition throughout the school system of the deep, rich, essential meaning of the manual-training idea.

It is a significant fact that our literary schools, on the one hand, are giving increasing recognition to laboratory and kindred values, while our technical schools, on the other hand, insist on their loyalty to literary values. That is to say, they both agree that manual training, in its essential idea, is not a matter of the hand only, but of the head and heart as well. Whether the shield is silvern or golden no longer embroils the knights, now that they see it is neither the one nor the other, but most truly and surprisingly both.

I am aware that this paper offers nothing that is new about manual training. It answers well for many another's experience as for my own. Its service, if it has any, is for the novice and not for the expert. The full-fledged manual-training school, in the narrow sense of a school with benches, forges, and lathes, is often an impracticable thing; not so the invigorating presence of the manual-training idea. Let the novice cultivate most religiously such beginnings of this idea as find lodgment in his soul. Should his heart faint because of the meagerness of his capital, let him read the parable of the talents,— it was told for the teacher, as for others, by the greatest Teacher of all,— gird up his loins anew, and make the most of his humblest opportunities.

MANUAL TRAINING AND MENTAL DEVELOPMENT.[1]

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THE honor conferred by the invitation to address this association, is equaled only by the pleasure aroused by the thought that I speak to an assembly of friends. We are friends in an educational way, because we have the same ideals, the same methods and the same hopes of success. Experimental psychology is simply psychology developed by laboratory methods and the laboratory is nothing more than a part of the manual-training system. What I have to say today, could by mere change of terms and illustrative examples be made to apply (1) to the physical training involved in the gymnasium and in sports and games, or (2) to the system of laboratory exercises in a college or a medical school. The purpose of my address is to enforce the view that the purpose of manual training is not the learning of various manipulations, but the development of the character and intellect of the child. To illustrate this, I will take a few concrete examples, rather than make general statements.

A large portion of manual-training work consists in voluntarily using the muscles to perform certain manipulations; the use of the pen, the brush, the hammer or the saw calls for voluntary muscular acts. What is a voluntary muscular act? A muscle is a contractile body which can decrease in length when irritated. It can thus be made to perform work. This irritation arrives at the muscle through an end-plate at the extremity of a nerve. In voluntary acts the nerve receives its irritation from the brain and connected with the ultimate origin in the brain is the act of consciousness that we feel in ourselves directly as an act of will.

Let us consider the properties of a voluntary act known as its *force* and its *energy*. Its force is its power at any particular moment, and its energy is the amount of work it can do. We can measure the force of an act by a dynamometer and have it recorded constantly by a dynamograph. Another method of measuring energy requires the subject to tap as rapidly as possible on a telegraph key, the amount of work he does being indicated by the number of taps he can make in a given time.

[1] Read before the American Manual Training Association, June 30, 1899.

Let me now briefly describe a few experiments.

Suppose we have a person pressing on a dynamometer, pulling at an ergograph, or tapping on a telegraph key, and doing it as hard as he can. The "hard as he can" does not mean "as hard as the muscle can," because by electrical irritation the muscle can be made to act still more strongly. It also does not mean "as hard as the nerves can" for direct stimulation of the nervous system can produce stronger movements. It really means as hard as he *wills*, and the fluctuations in the results represent fluctuations in *will-power*.

Again this does not mean as hard as he *can* will, but as hard as he *does* will. For he can nearly always be made to will more strongly. Thus, if you say to him "you are not doing as well as most people," he will at once make a better record. Excitement, competition and the like increase the force of the act of will.

Now, what does practice do in the case of voluntary action in this one respect of power? Let the practice be in raising dumb-bells, or in striking blows at the forge with the hammer; the power to do this steadily increases. Is it the power of the muscle or the will power? It is undoubtedly both. The muscle develops to a certain extent; it increases in size and firmness. But in properly arranged work, the increase in power continues *after* the muscle has reached its full development, and often does so quite out of proportion. In the gymnasium it is a well-known fact that the muscles will often show very little increase in size and firmness, whereas the pupil will develop rapidly in power. Practice in a voluntary action develops the will as far it is concerned with that act.

If you agree with me as far as this, I do not see how you can escape agreeing to the deduction that all exercises that develop strength of action, also develop strength of will for the particular activity concerned.

There are other properties of voluntary acts: quickness, steadiness, accuracy, gracefulness, etc., to which we can apply the same reasoning. What is the final conclusion? That the development of our voluntary activities by practice, is largely a development of the particular force of will involved, and, also, that to develop the will in these particulars the proper method is to employ exercise for voluntary movements. Thus exercises, like marching, dancing, swimming, and physical sports, also sketching, painting, clay modeling, forging, wood-carving, etc., are exercises to be employed for developing will.

This first thesis: "that practice of any activity develops the will

for that activity," I wish to follow by a second one, namely: "development of *will* in any way involves a development in other ways."

I fear that these are two very strange and startling statements. If they are true you can at once deduce the conclusion that practice at the lathe makes a man a better banker, or that a good course in forge-work will assist in fitting a theological student to hammer at the sinful souls of his future congregation. Yet I have established the first thesis, I hope, and I believe that I have adequate experimental proof to substantiate the second one to a large extent.

I will again refer to some experiments. Some years ago one of my pupils made some experiments with a dynamometer, in which on the first day she squeezed as hard as she could with the left hand, and then with the right hand. The pressure was registered as 30 inches of mercury for the left hand, and 29 for the right hand. Then every day for more than a week afterwards she practiced squeezing with the right hand only. The records ran 34, 36, 37, 41, 45, 47, 49, 49. On the last day the left hand, which had not been practiced at all, was again tested, giving a record of 42. Thus, the left hand had increased in power by practice with the right. This phenomenon I named at the time "cross-education."

Another pupil tried the experiment of seeing how often she could stick a needle on the end of a stick into a certain hole of a brass plate. On the first day she succeeded 50 per cent. of the times with the left hand and 61 per cent. with the right. Thereafter she practiced the right hand with the results on successive days of 61, 67, 65, 75, 74, 75, 82, 79, 78, 88 per cent. On the last day the left hand was again tried, with a record of 76 per cent. Here again was a case of cross-education.

Practice of one limb of the body develops the symmetrical limb. But *what* is developed? In the case of the latter experiment it cannot be anything muscular; it must be action of the nerve-centers governing the movement. In the case of strength I have direct proof from experiments by another student that the muscles of the unpracticed arm do develop slightly, but not in proportion to the development of power.

Six subjects were chosen, definite girth measurements of both arms were taken, and the number of times ascertained that each arm could raise a weight of 5 pounds. A dumb-bell was given to the subject, who was instructed to lift it from a position where the arm hangs extended downward and the weight is supported from the shoulder, to one

where the arm is flexed and the weight is close to the shoulder. In this movement the elbow remains stationary. Hence, to accomplish this act, the biceps is employed almost wholly, though the muscles of the forearm are also used to a lesser extent in gripping the dumb-bell. The right arm alone was practiced for a considerable time. The result was: the right biceps gained largely in size, and the left biceps less, whereas the left arm as well as the right gained greatly in power.

Now let me tell you of still another experiment. Telegraph keys were so arranged that they registered the rapidity with which a person could tap them. On the first day both index fingers, and both big toes were tested. After that the right big toe alone was practiced for over two weeks. Then all were tested again. The results were as follows: Four of the persons tested gained on an average in the power of the right big toe by 33 per cent. The unpracticed left big toe gained 31 per cent.; the right index finger gained 21 per cent., and the left index finger 31 per cent.

These experiments establish the fact of *radiating practice*, a more important and higher principle than that of cross-education. What can we conclude from this? I believe that we can support the hypothesis that, "physiologically speaking, the development of the center governing a particular member causes at the same time the devolopment of higher centers connected with groups of members. Psychologically speaking, development of will power in connection with any activity is accompanied by a development of will power as a whole."

If this principle can be established, several very important deductions may be made in regard to the training of the will. It has been observed in the public schools that backward pupils may frequently be aroused to activity by giving them lessons in manual training. Their backwardness can be presumably attributed to lack of interest or of power to pay attention, in other words to undeveloped will; certain kinds of manual training are specially favorable to the development of will power in certain activities. Assuming the truth of the principle just propounded, this development would be extended in a less degree to all other activities of will.

At the Elmira Reformatory this principle is well recognized. Among the boys sent there for committing various felonies, such as burglary, assault, theft, and the like, many are found who are criminals on account of mental defects. These defectives are placed in a manual-training school. The exercises in this school are arranged in

three groups: (1) for boys of poor intellect; (2) for those lacking in self-control (*i. e.*, will-power); (3) for those deficient all around. The second class is of interest here.

This group is composed of those who are, for the most part, devoid of moral tone; those who fight, swear, assault officers are licentious and generally irresponsive to the usual methods of reformation. The class includes some of the most intellectual men in the Reformatory. I have seen a young fellow of eighteen or nineteen years of age receiving the molten iron from the furnace into his ladle and pouring it into the mold, his face beaming with brightness and enjoyment, apparently as fine a young fellow as anybody would wish to see; and yet this very superabundance of his intellectual activity, without a correspondingly powerful self-control, continually led him into crime. Such a character is like a charged automobile with a careless child instead of an experienced man in control.

The work of Group 2 (Self-Control Defectives) comprises the physical exercises that are known as the United States Army and Navy "setting up" exercises. The fundamental principles are "regularity of movement and duration of particular performances." The act of lifting one's body through space from ring to ring, sixteen to eighteen feet above the floor level, or of engaging in hand or football, where intense rivalry is induced by chances of advantage over a competitor, with the muscular force brought into play or at rest at command, tends to healthy, good-natured determination of the will and to control over one's impulses.

The manual-training work given to these men runs in this way:

First term — Geometric construction involving intersection of solids, etc., wood-turning, clay-modeling, sloyd, mechanical drawing.

Second term — Wood-carving, clay-modeling, sloyd, mechanical drawing.

Third term — Chipping and filing, molding, sloyd, mechanical drawing.

It is needless to go into details. You all recognize that these employments require control of attention, steadiness of thought, and firmness in execution.

I will give only one example of the effect produced by such a course on one of these defectives. The account is taken from the Elmira Reformatory Yearbook for 1897:

This is the story of Conscript No. 6924, who was assigned to manual training in March 1897. This pupil came to the school from the third grade, or incorrigibles,

having been sent there as a result of continued depravity. In the July following his admittance he lost ten marks as a result of continual talking, laughing, and slovenliness, and for these offenses he was reduced to the second grade, July 21, 1895.

In August he lost ten marks and was in seclusion three days. In September he lost eleven marks for malingering, carelessness, and talking. He was sent to seclusion again, this time for two days. In October he lost five marks for malingering and talking. In November he lost four marks, talking and laughing. In December he lost two marks for denial of legitimate report and for untidiness.

In January 1896, he lost eleven marks for conspiracy, etc.; in February he lost five marks for talking and slovenliness; in March he lost ten marks for talking and slovenliness. On April 2 he was sent to the third grade for treatment as an incorrigible, and remained there until June 25, when he was given a chance to mend his ways and temporarily assigned as a laborer in the improvement squad to work on buildings then in course of construction. In August he lost one mark for wasting food. In September made a good record. In October he lost three marks, November ten marks, and in December he lost one mark with the result of the modified treatment being withdrawn.

In January 1897, he was in the third grade (incorrigibles). On March 6 he was assigned to manual training, Group II (Self-Control Defectives), with subjects as follows: athletics and calisthenics, mechanical drawing, molding, sloyd, chipping and filing; each subject one and one half hours per day, five days per week.

Here begins a phenomenal change. The first month of his assignment he made a perfect record and was restored to the second grade. From this time on there was a sustained effort to improve. The influence of intelligent, systematic, and entertaining employment, based upon principles fundamentally correct, began to show fruit, and he grew up rapidly into personal respect, moral elevation and responsibility. This pupil, for the entire time of his manual-training assignment, four months and one day, did not lose a mark; also during this time his reports were only one second class report, two third class reports, and one labor report, or a total value of only eighty cents in four months and one day; this in contrast to his earlier records of ten and eleven lost marks almost monthly is remarkable. He was restored to lower first grade July 1, 1897, having earned promotion. He was graduated October 4, 1897, and retained in capacity of instructor in sloyd classes and is doing well at this writing.

From extreme cases we can derive suggestions for normal ones. The points of interest here are, (1) the fact that certain forms of manual training are adapted to the development of the moral character, (2) that there is a possibility of diagnosing the mental and bodily condition of the pupil, and placing him at the kind of work he most needs.

What must you, as manual-training teachers, do?

On the basis of child-study and of personal knowledge, you should diagnose each child's need as accurately as a physician diagnoses the case of a patient. You have a child's whole character in your hands. Would you put him at drawing, when he does not need that kind of work, or keep him from forging, when he needs development in decision of character? A physician has on his conscience the health or

death of his patient; you have on your's the welfare of the child's whole character. You must study and care for the needs of every child with all the aids that science and art can furnish you.

Your manual-training work must be organized on a system adapted to the proper development of the child. If you put in an exercise in filing simply because you think it "a good thing," without knowing why, you are exhibiting an ignorance of science and a carelessness in regard to your duty that are simply inexcusable. If you put in a filing exercise at the right point to develop the child's honesty, his determination, his understanding, you are doing your duty in the proper way—in the only admissible way.

Consider now another aspect of the subject: the relation of manual training to intellectual development. Referring again to the Elmira Reformatory, we find there Group 1, composed of those who regularly fail in arithmetic in all its steps from the kindergarten number work to percentage. This failure is an indication of a weak intellect. Subjects are selected in which mathematical propositions especially enter, both in tool processes and other mental training. The work comprises:

First Term — Mechanical drawing, sloyd, clay modeling, mental arithmetic.

Second Term — Mechanical drawing, sloyd, card-board construction, mental arithmetic.

Third Term — Mechanical drawing, sloyd, wood-turning, mental arithmetic.

I select only one example of how this works:

Conscript No. 7130 was received August 2, 1895; age, 16 years; crime, attempt at arson second degree. This pupil was assigned to manual training on January 29, 1896, having failed in every examination since his admittance, now five months. He was classified in Set 7 (multiplication, division, and miscellaneous tables). In January he was reduced to Set 9 (numbers to 1000, addition, subtraction, and multiplication). For four months he failed successively in that set. In June he passed in arithmetic, making his first sustaining mark in arithmetic since his admittance to the institution, now ten months. He had been a manual-training pupil five months with subjects as follows: mechanical drawing, clay modeling, athletics, sloyd, and mental arithmetic. Each subject one and one half hours per day, five days per week. In July he passed 76 per cent. in arithmetic and 86 per cent. in language. He passed in October in arithmetic at 80 per cent., language 75 per cent. Failed in November in arithmetic, and passed intermittently for the next four months. In April the result of manual training for the past sixteen months began to make permanent impressions on the pupil. The lessons in drawing, which involved transpositions from one scale to another; the tool processes, where accuracy of sizes and projection of parts decide

the construction as right or wrong; also the athletic performances, wherein quick, definite movements are required—each had exerted an influence towards mathematical development. In May he passed at 88, 80, and 75 per cent. in language, arithmetic, and trade-school work. In June, 95, 90, and 75 per cent. In July he passed at 91, 90, and 75 per cent., giving evidence that he had the ability to perform understandingly the arithmetic in the sets to which he was assigned.

I can go no further into the Elmira methods. Anybody interested will find the complete account in the Elmira Yearbook for 1897, pages 57–121

The question of interest to us now is: how is it that manual-training exercises can develop the intellect, or the whole grade of mental activity? I will select a few of the most important principles governing the phenomenon.

One principle is that which I may call "irradiation of mental activity." It may be stated as follows: *Mental activity of one kind facilitates mental activity of all kinds.* This occurs from no mysterious or wonderful reason, but simply because all forms of mental activity have certain elements in common. Thus wood-turning develops certain elements of exact thinking and self-control; some of these same elements are involved in forge-work; thus the work of wood-turning aids in forge-work, and likewise the reverse. Again, some of the mental elements required by a successful banker, such as imagination (planning future investments), or self-control (restraining the impulse to share in attractive but insecure investments), and so on—some of these are found in such occupations as clay-modeling and wood-carving. Again, the manliness and the self-confidence that are required by a leader of men—be he saint or sinner, a clergyman or a politician—are composed of elements that can be developed by a system of games and sports such as swimming, football and the like, or by an appropriate system of manual training including wood-turning, forging, and free-hand drawing.

This principle, however, has its limitations. Mental activity of one kind develops mental activity of all kinds, provided there is anything to develop. Every person has on hand a certain amount of energy—nerve energy, or mental energy. This energy is supplied by nutrition of the nerve cells, which occurs mainly during rest and sleep. This nutrition can be increased by good food, baths, exercise, good air, and good sleep, but each person has his own maximum for any given set of conditions. Now, when you draw upon this supply of energy for one purpose, *e. g.*, arithmetic, you have less left for other purposes, such as history or physical exercise. Thus it sometimes happens that the development of the intellect is pushed too far, the draft on the

nervous system is too great, and the pupil becomes weaker in other activities than he was before. So exercise of one activity cannot indefinitely improve the pupil unless the general health of his nervous system improves also.

But still another principle helps us out here. It is that *use develops the health and strength not only of the nerve center used, but also of the various other centers and organs connected with it.* Intellectual activity, when not carried far enough to produce fatigue, increases the health and strength of the whole nervous system and the body. That is, it is healthful to be intellectually active but never fatigued.

In conclusion I will summarize a few of the points I hope to have made clear, and will suggest a few deductions.

A. Manual training develops the intellectual side of the mind as nothing else can. By book-work or by study a boy never learns to think or understand, or even remember, as well as he might; it is only when he gets involved in sports and games like baseball and canoeing, or in machinery like lathes and buzz-saws, or in laboratory complications like chemical analyses and measurements of electricity, that he ever learns to think fully as a man.

B. Manual training develops character as nothing else can. Educators have long complained over the lack of the means of moral development in the schools. Of what good is it, they say, to teach children to be good at numbers, to be skillful in speech, and to be familiar with persons and places, if you do not make them at the same time morally sound? If the schools graduate liars and thieves, all that education has done for them is to enable them to lie and thieve in business and politics where they are not easily caught, instead of in the slums and dives where the police know how to get them. But *here* is your means of educating character. Honesty is directly developed by all exercises in precise measurement in a regular gradation from the blacksmith's forge upward through the carpenter's bench, the machinist's lathe, the chemist's balance, and the physicist's electrical scale. Careful courage is directly developed by the grasp on a sharp instrument, or by facing a rapidly whirling lathe. Sociability and solidarity are developed by the games of the kindergarten and by the making of pieces of machinery in common.

C. Manual training furnishes the pupil with real knowledge; it teaches him something. The laboratory method — the method of learning by doing — is after all the only method of learning anything, whether it be drawing, or Greek, or chemistry, or mathematics. The

attempt to commit facts to memory by reading books is hopeless. What is memorized in this way fades in a short time, leaving little or no trace. To learn a poem we must *say* it over and over again; to learn German we must speak and hear its words thousands of times; to learn history we must talk and discuss and write essays on its topics. To learn to think, to choose, to decide, to abide by a decision, we must practice exercises in which these mental processes are involved. And the purpose of the kindergarten, manual-training school, college, and university consists largely in selecting and arranging just such sets of exercises.

THE ART BASIS OF MANUAL TRAINING.[1]

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WE have become used to speak of manual training in a restricted sense. Of course it is agreed that clay modeling is manual training, as are drawing and painting. Any activity in which the hand engages as, at once, the investigative and executive organ of the mind, is manual training. But the three modes of expression just mentioned have come to be known as the art modes, while the term manual training has fallen to the lot of those kinds of constructive activity which make ostensibly for utility. I say "ostensibly" because I would not assent to any definition of utility that does not grant a higher utility, esthetic in its nature. All of these modes of manual activity are features of the public-school course of study, and were so when the Committee of Ten came together. But that body adjourned too soon to mention the fact.

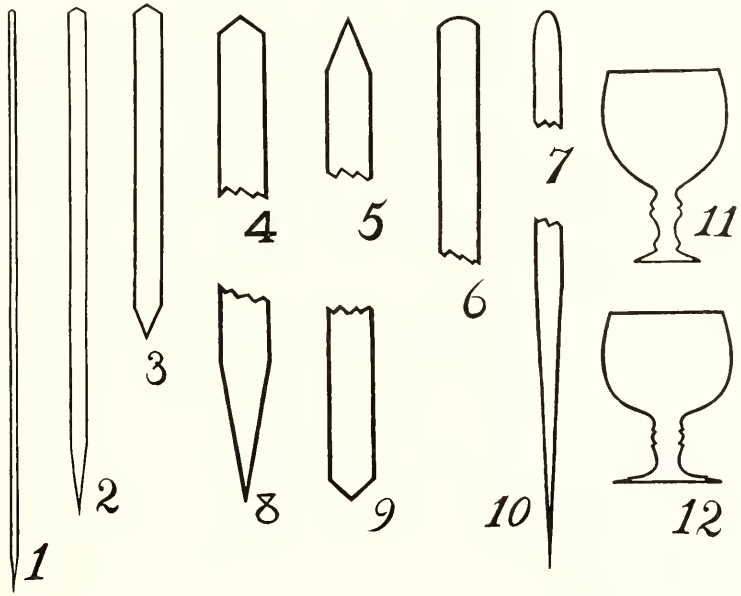
This distinction into which we have drifted, this classing one group of activities as art modes and another as manual training, or utility modes, has given rise to a misapprehension. Out of this exclusion of construction from the art group has arisen an implication, perfectly innocent, but an implication still, that art is extraneous to and independent of construction; and that manual training is one thing and art training quite another.

If we consider the nature of our public-school art training we are confronted with the one descriptive term, decoration. I am mindful of a growing and highly valuable picture study. But studying works of art is contemplative, not creative. And although the intimate relation of the one to the other is granted, that relation is consummated only so far as creative power is given play. There is, too, a good deal of representation, or picture making, by our public-school pupils, but not enough to displace decoration as the chief aspect of the educational art tendency, particularly in its aspirations and promise for the future. In the present consideration, we may regard decoration as wholly representative, since, so far as the manual-training courses are to be modified in the direction of art, such modification will be decorative in its character.

[1] Read before the American Manual Training Association, July 30, 1899.

We have in hand, then, two propositions. First, that our present constructive or manual-training courses are devoid of a distinct art value. Second, that the remedy lies in the introduction of the decorative element.

The early experiments in manual-training courses were, it is to be admitted, tolerably uninfluenced by art. The sawing of a board,



simply for the sake of skill and kindling wood, cannot lay very direct claims on the attention of the art critics. And the making of a group — I do not say series — of joints, devised by a carpenter, and, as a rule, taught by one, was not a close approach to the art idea. In fine, nothing short of integral creations can be art products. After some years of the reiteration of this principle, the complete model idea came to be recognized in a greater or less degree in all courses in manual training, from those offering occasional "projects" interspersed among the exercises to those in which the models followed in unbroken sequence, without interspersions.

But at this stage the carpenter idea yet prevailed. The projects, or models, were models only by courtesy. In effect, they were merely

exercises. Proportion, contour, balance, unity—those terms, so frequent in the artist's vocabulary, were wanting. They are wanting still in some courses, particularly those used and originated in England. The failure of these model series in the artistic value appears to be referable to the fact that they have been devised wholly from the exercise standpoint, uninfluenced by other considerations.

There is probably more of esthetic possibility in unadorned construction than we are wont to recognize. All spontaneous expression, be it under skilled guidance, will make ultimately for beauty. No other expression is educative. As often as a constructed object may be ugly or beautiful, according to the hand that fashions it, so often the element of choice is presented, and the possibility of art. Wherever a creation is the expression of an eager soul, undriven save by native impulse, it makes toward art, whether it is decorative or not, and whether it be sightly to the enlightened or not. Art is saying to your brother what God says to you. The vehicle of expression does not signify

In so simple a creation as the flower stick, we find most of the essential problems of art. Take proportion. The ratio of thickness to length. You say No. 1 is a poor form, because, burdened with foliage, the wind would snap it off. And No. 3 is equally poor, because it is bulky, out of proportion to its work. It wastes material and room.

Even the width of the bevel is a determining factor as to whether the model shall be an art product or a piece of kindling. The edges of one model bespeak the crisp, decisive stroke of the tool. If the worker were Michael Angelo, chiseling his Moses, you would exclaim: "See the strong, sure, passioned stroke. That is art!" Another model will show surfaces vaguely eroded away with sand paper, as characterless as desert dunes. Between the two pieces of work you have all the difference between art and occupation.

Even the pyramidal top reveals the art perception of its designer. Just why No. 4 is more pleasing than No. 5, is not easily said. Perhaps because that end is not designed to pierce a way, but should merely offer a watershed. Similarly, in a round flower stick, the eye chooses No. 6, instead of No. 7, perhaps for the same reason.

The other end of the stick is an easier matter. No. 9 is too blunt to easily enter the ground. No. 10 would snap off as it pierced among the roots and gravel.

In this view, function is the basis of all art. Art obtains as function is more or less intimately served. You can go fishing with a crooked

stick. But a well-made split bamboo rod answers function better. And the exquisite curve of that rod in action is the expression of the art that brought it forth. It would be difficult to name a more genuine art product than this same split bamboo. No circumstance in nature —a rocket's flight, or a bramble's reach—better exemplifies the curve of force. Art cannot transcend mathematics, whether it outreaches mathematical research or not. Whether it be a question of music, or color, or form, it is a question of interval. Interval, in turn, determines proportion. And proportion subserves function.

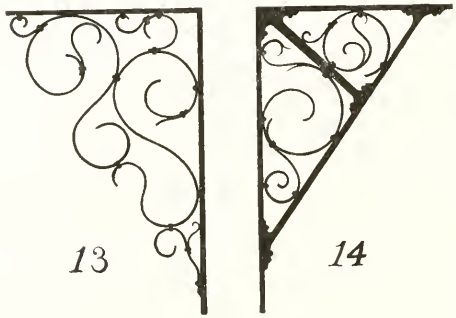
This test answers all questions. It justifies or condemns finishes. We may use paint, varnish, or shellac upon a model, in order to protect it in its future employment. Indeed, our flower stick cannot be regarded as a complete expression until it is painted. It is going out into the weather, and requires a protecting surface. Models in general may be and should be shellacked, in order to remain clean. An unprotected pine surface, with its resinous secretion, will collect an unsightly burden of dirt in a week's use.

It is apparent that such finishes serve a definite function, and are organically a part of the model. The human body has such a finish, though of multiplied duties. And apples and all of nature's organisms have this finish, whose first warrant is utility.

The various wood stains do not fall into this class. To make believe, to an easily deceived eye, that pine is cherry or oak, does nothing toward preserving the surface so stained. The first kick of a child's copper-toed boot will tell the truth. Perhaps wood stains are justifiable, where a color harmony is aimed at, between the model and its surroundings. But such expedients should be warily admitted into a manual-training course.

In the wooden cup, Nos. 11 and 12, the obedience of proportion to function is exemplified. (These two profiles are approximated from the lathe work of two students in a prominent manual-training high school.) The base of any vessel assumes the definite office of giving a stable support. If it fails in this, it is ugly, and its ugliness attaches to the whole creation. You may carve this No. 11 with all the craft of Cellini, and it is ugly still. You may inlay it with a mosaic of gems and gold, and these adornments, by their own worth, will reproach it the more with its natal fault. I have seen these things transpire. I have seen eight-year-old children launched upon eighteen-year-old projects in joinery, and then attempt to palliate the dismal ruin by a crowning calamity of eighteen-year-old decoration.

Here is the common bracket, Nos. 13 and 14. In various modifications it is scroll sawed in wood, or fashioned in Venetian iron, or carved in bulk. With your intricate and subtle curves you may rival oriental traceries, but your No. 13 will still lack beauty. Indeed it will be no bracket at all, lacking the principle of the triangle. Try to remedy this short coming by casting the piece in iron and you impose the function of support upon details purely decorative in their nature. You get strength (in an inferior ratio) but no beauty. A direct perversion of function cannot be artistic.

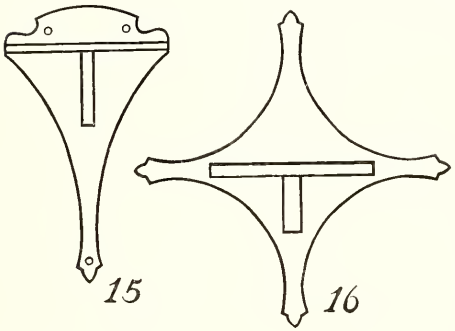


The sure way to miss beauty is to try to create without a core of principle; to invent style for style's sake instead of for truth's sake; to strain after an individuality that has not God within it. If we are so successful as to build this thought surely into the pupil's life, he will never mistake mannerism and eccentricity for art, nor ever, in his own expression, go after these false gods.

Tables are to support burdens and chairs are to sit on. If they are not adequate in these uses they have no sanction in art, unless they be historical examples. In this case their place is in the museum, under glass, not in your reception room, under your guest.

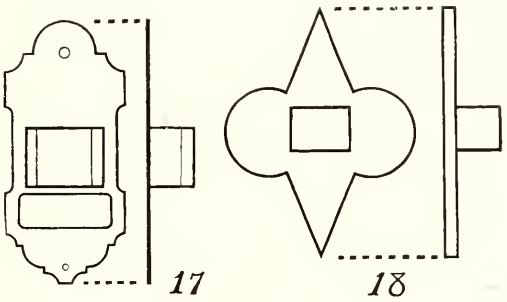
If you are making a match box you do not want your wood half an inch thick. If you had a squirrel you would not build a lion's cage to keep him in. It is the question, once more, of function. A superfluous length, breadth, or thickness of stock is as much a violation of principle as would be a gold scutcheon on a woodshed door. Appropriateness is the password to the domain of esthetics. A clumsy model is not esthetic because it has a lot of stock in it which should not be there. A model may show too much stock in a variety of ways. The form of a wall bracket is explained from the standpoint of leverage. The down-projecting arm in No. 15 prevents an undue outward pull upon the supporting nail. It is, therefore, not a vagary but a structural necessity. And a little tapering of its lines removes unnecessary stock and makes the arm a decoration as well as an organ. Now

suppose similar arms be added, right, left and above. They have no reason for their being. They are not useful; they are not decorative; they are only bad. Suppose their surfaces be now carved. They stand then only as a basis for decoration. Basis for decoration is a psuedo function. The problem in art is not to find a place to decorate. It is to find a decoration for the existing place.



The matchsafe, No. 17, is shown as a fair example of good form. The vertical extent gives stability and at the same time provides a place for the sandpaper. Both of these conditions justify the form, and we give our assent without a conscious analysis. No. 18 is not so good. The backpiece is unnecessarily thick. The curved wings are without function. If we glue upon each a piece of sandpaper, it will help. It will give them some excuse for existence. As the model stands we have a tremendous backing serving a very small purpose.

Returning to the question of decorated construction, I believe there is a place for it in the manual-training course. Its possibilities and limitations have to be worked out. Decoration is story-telling — it is song making; and song and story have a place in the higher utility. Good design is functioned design. The human mind is so complex in its activities that your eye must read a story even during your moment's wait in the reception room. That story lies in the figured wall before you; or in the carpet design; or in a carven piece of furniture. The tracery is your entertainment during this moment of abstraction. We must



have this undercurrent of story — of reference to non-present circumstance — threading all our "brown studies." And therein is the value, to a very great degree, of the twin arts, music and design.

Now, if the design fails to foster a sequence of pleasant reverie in one of a sensitive nature, it is wrong somewhere. It is fretful and overwrought; or it is inappropriate in its theme. A mud turtle is a thing of beauty among the lily pads, but how awkward a guest upon your parlor carpet!

Emerson is full of the congruity that should advise decoration:

I thought the sparrow's note from heaven,
Singing at dawn on the alder bough.
I brought him home, in his nest, at even;
He sings the song, but it charms not now.
For I did not bring home the river and sky;
He sang to my ear; they sang to my eye.
The delicate shells lay on the shore;
The bubbles of the latest wave
Fresh pearl to their enamel gave;
And the bellowing of the savage sea
Greeted their safe escape to me.
I wiped away the weeds and foam,
I fetched my sea-born treasures home;
But the poor, unsightly, noisome things
Had left their beauty on the shore,
With the sea and the sand and the wild uproar.

Design is most appropriate on large surfaces and prominent structural lines. A small object is usually of sufficient variety of line and individual interest to make decoration superfluous. Many a watch-case, fretfully wrought under the engraver's chisel, would be a more integral piece of art if no art had been expended upon it. In this connection we are always safe if, with Ruskin, we seek not to construct ornament, but to ornament construction.

Two precautions seem advisable in the application of design in manual training. First, that the pupil be permitted to decorate his own construction only; and, second, that we have a care lest our curriculum is suddenly perceived to have two courses in design and no course in construction. Design is a large part of art, but it is not the whole. To use a homely figure, I should say that the relation of construction to decoration is about that of bread to butter. And I would use this figure, too, as symbolic. It would be a miscarriage of appreciation to so revel in the qualities of good butter that we by and by came to eliminate the bread. It would be a unique outcome of

popular education did our graduates sally forth, brush or chisel in hand, in a fervid, quixotic search for surfaces to decorate. Lest this should sound frivolous, I would remind you that we are, at the present time, suffering the effects of this same mistake in another direction. Until the advent of the manual-training high school, which is as yet scarcely felt in the large inertia of our school organization, our public schools habitually and avowedly graduated a tremendous preponderance of business and professional men, in aspiration. It is evident that the middleman is without place except as skilled labor puts forth a product to be marketed. Hence our hands-in-their-pockets brigade forms an important element in the community, speaking numerically.

The first stipulation, concerning the decoration of one's own construction solely, is ventured in reference to a good deal of work that is going on in elementary schools having inadequate tool equipment. The neighboring mill furnishes the breadplate. The pupil, often several years too young for his task, furnishes the power behind the carving chisel. The result — to the eye — is a three-cent desecration on a fifty cent bread plate. If the child decorates something he has made himself, there is no desecration. There is no misadjustment. The whole product is an integer, expressing the pupil in a certain stage of healthy growth. I have specified the result manifest to the eye. If we look at that other outcome, measurable only by what we should have to call a psychometer, the scope of this paper would not suffice for an analysis. But we may express the belief, in a general way, that the man who now "lives on the interest of what he owes" used to be the boy who decorated mill-made bread plates and writing desks.

The difference between construction and decoration is the difference between the Greek and the Renaissance. The Greek built a pediment because it was a part of his temple. His admirers took the pediment and fixed it against a wall that was a wall without it. The Greek filled that pediment with human figures that acted out a story. It was a story of his own. We borrow his figures and his story, as if we had no story of ours. And we draw his pediment until we know it by heart. But we could not build that pediment, if we were put to it — and we shall never be put to it. We have, therefore, been studying history — in one of its graphic phases. It has been a study of the *history* of art primarily, and of intrinsic art only by reference. We have already a host of graduates who can recognize a Greek pediment wherever encountered, but cannot appreciate an organic relation, nor express one. They are quite satisfied with our suburban version of Queen

Anne, and ought to be equally so with the composite mermaid of the dime museum.

In closing, I want to urge again a more liberal art criticism of constructive work — in its possibilities, at least; a more liberal estimate of the beauty value of form, irrespective of ornamentation; finding a powerful precedent in the Greek, the most beautiful of all the schools of constructive art, in which the structural mass transcends in beauty its own most chaste and artistic embellishment.

REPORTS OF MEETINGS

THE AMERICAN MANUAL TRAINING ASSOCIATION.

THE sixth annual meeting of the American Manual Training Association was held at Teachers College, New York, on June 30 and July 1, 1899.

The opening address was delivered by Professor Charles R. Richards, of Teachers College, president of the association, who extended to all present a cordial welcome on behalf of the trustees of the college. The association was meeting at the threshold of a great university which recognized manual training as a part of a well-ordered scheme of education. It is in the contact of the manual-training teacher with other teachers and with educational thought that our hope for the future lies. Many of us started as teachers of a subject, but have come to realize that we are teachers of children. We are still apt to think too much of what we have to do rather than how we are to do it. When our work has been conducted in the spirit of the specialist, rather than that of the teacher, it has failed to command respect. Our successes and our failures point to the same truth — that we must come into organic relation with the general scheme of education; we must be a part of the whole. When these conditions are reached manual training need have no fear for the future.

The president then introduced Professor E. W. Scripture, of Yale University, as the first speaker. [Professor Scripture's address is given in full on pages 16 to 25.]

MANUAL TRAINING AND BRAIN DEVELOPMENT.

On opening the discussion of Professor Scripture's paper, Dr. Frank M. McMurry said he believed that in our school work we were being drawn nearer and nearer to manual training. The laboratory idea should be more emphasized. But he would question one statement made by Professor Scripture, viz., that the development of volition along one line would develop volition along all lines. The proof of this had not been furnished. Progress during the past twenty years had consisted in the main in the denial of this proposition. We do not believe that the development which comes from the study of Greek will develop the student in all directions.

After some further discussion, Mr. Bates, of Elmira Reformatory, was called upon to give some account of the work of that institution as throwing light on this subject. In responding, Mr. Bates pointed out that the manual training at the Reformatory differed considerably from that in the schools, the work being adapted to the individual needs of the men. A diagnosis of each case is made, and each man placed in the class in which the work is best suited to his requirements. Surprising results in the development of will power are frequently obtained. After gaining power by means of tool processes the convict is found to retain what he has gained when the tool-work is discontinued. Many have made such material progress in self-control that they have been discharged from the institution to become honest and respectable citizens.

Professor Churchill thought it unwise to attach too much importance to the experiments described by Professor Scripture. He did not believe that the will power gained

by practice in placing a needle point in a hole would make a person much more generally efficient. Frequent repetition of the process might produce an idiot. Practice with the right great toe might afford some development to other toes and fingers, but it would not make a man a pianist. The appreciation of a right angle might have some slight effect on a man's "squareness" in business, but we might well bear in mind that the man who knows how to engrave a counterfeit check, or open a patent safe combination which does not belong to him, presumably has a good deal of such appreciation. The speaker thought that the magnificent results at Elmira were due to other elements entering into the problem as factors.

Dr. McMurry believed that if the work at Elmira had been literature instead of manual training there would still have been a percentage of gain. Improvement comes from the field of thought rather than from mere mental activity.

Professor Scripture, in closing the discussion, showed that his first thesis was based on definite experimental proofs. It is a fact that the development of the right biceps does develop the left. He admitted that he had not furnished definite proof of the theory that the development of volition along one line would develop volition along all lines, but he believed this is being proved by the work at Elmira. A well-defined advance in the powers of observation had been gained by practice in amateur photography. The study of Greek develops the power to remember and to think on certain lines.

THE ART BASIS OF MANUAL TRAINING.

The second paper on the program was that of Mr. Walter J. Kenyon, of Lowell, Mass., on "The Art Basis of Manual Training" (see pages 25 to 34). Before proceeding with his subject, Mr. Kenyon remarked that a powerful factor in the work of reform at Elmira was the bringing of the esthetic element into the lives of the patients. They had never learned that two and two inevitably and inexorably make four. They learned honesty by manual training.

Professor Churchill, rising to reply to some points which had been raised by previous speakers, said it seemed to be his fate to be in the opposition. The exercise of one organ of the body undoubtedly assists in the development of another, but the extent to which this is true is very well illustrated in the case of the baseball pitcher, the development of whose right arm is quite out of proportion to that of the left arm or the legs. Mr. Churchill could not accept the notion that there is a scientific basis for everything. What scientific basis, for instance, can be given for the love of a mother toward a bad and ungrateful son? So it is in art. For some things we may find a scientific basis, for others we cannot. The discovery of function in design does not begin to solve all problems. The portals of St. Marks, or the Cologne Cathedral are many times the height necessary to admit a man bearing a candle. A nose perfectly adapted to its function may still be a very ugly nose. Feeling is fully as important as structural quality in design. Not enough attention has been given to feeling in teaching freehand drawing to children. The speaker wished to give his remarks a practical bearing by suggesting that the point at which feeling enters design is in the freehand draughting of the work. Such draughting must be done without instruments in the first stage.

Before we can have really successful design from our pupils we must have a system of freehand drawing which admits of the expression of feeling. The old copybook style of fifteen years ago, with its single, exact contour, excluded this. Gen-

eral drawings of Raphael and Ingres were shown, in which these masters had placed a foot or a hand, no less than six or ten times, until it "felt" right. What these great men did, we should not be ashamed to have appear in our attempts.

Professor Scripture agreed with Professor Churchill that many things were not explainable by science. Love, however, could be explained by psychology. The sense of the beautiful has been developed by history. We had come to regard as beautiful many things which in earlier days had taken their forms from the use for which they were designed and the necessities of construction. Mr. Kenyon endorsed this view, holding that function is the basis of feeling.

At the close of the forenoon's proceedings the president announced that a luncheon would be served in the students' room, to which all present were invited.

At the opening of the afternoon session the secretary gave notice of a motion to amend the constitution as follows: Article I to be amended by striking out the word "American" from the title of the association and substituting "Eastern." In Article V strike out the section relating to secretary's and treasurer's salaries. In Article VI strike out the clauses, "Provided the president shall not be eligible to the office for two consecutive years," and "candidates for each office having been first nominated from the floor."

The first paper read at the afternoon session was that of Dr. James P. Haney, of New York, from which is quoted the following:

"One of the interesting questions to be determined previous to the appointment of the shop teacher is the standard of his general scholarship. Interesting and important, too, because in no small measure this must decide his future welfare and promotion. That the point of view which regards the shop teacher as an instructor on a par in every way with the other male instructors in the school, one to be subjected to the same tests on entrance and eligible to the same promotion, is the wisest and fairest one, appears quite certain. Special salary schedules, if lower than the regular schedules, involve a lowering of the dignity of the special instructor; if higher, they cause friction and discontent among the larger body of the grade teachers.

QUALIFICATIONS OF A TEACHER OF SHOPWORK.

"That normal teaching generally, and particularly normal training in the special subject, should have formed part of this education, is also essential. It may be urged that this view regards attainments of a scholastic order, of superior moment to technical, or rather industrial, skill. This is, indeed, the attitude which experience has seemed to justify. The special training which the shop instructor will be called upon to give to the elementary schoolboy will be of rudimentary description. Far better have him a well-bred, well-read teacher, whose interests are not confined to his bench — one with skill sufficient to meet the demands of the schoolroom, and with appreciation of the meaning and purpose of the training which he is to give, than to have him a dexterous artisan, whose knowledge is all of his craft and whose aim in the workshop is the perfect exercise, and not the perfect boy.

"The settlement of this question by the supervisor, or for the supervisor, must profoundly affect the future of the shop-work under his direction; and the same reasons might be urged for high scholastic standards to be demanded of the special teacher of cooking.

"Were there one idea more than another to be impressed upon the teacher in the shops, it would be what may be called, for want of a better term, the laboratory

idea. The thought that the shop is not a carpenter's shop, but a laboratory where personal experiment and demonstration in ways of order and of skill prevail, to the end that the characters builded may be as evident as the products of the bench. The idea, then, of absolute cleanliness, of order in details, of system in plan and in work, of quiet and personal labor, of original effort — this is the laboratory idea.

"It is, or should be, a requirement that the inventive power of the child enter into the exercises of the course. When best developed this requirement emphasizes the individuality of the teacher and the creative activity of the child. If the course encourages such effort, the spirit of the modern teaching of science, and all that is included, is maintained. If the shop exercises are prescribed by supervisor or course of study to the end that the instructor plays little part, and the child less, then this spirit is lost, no matter how attractive the prescribed exercises may be. This point seems vital to the success of the manual arts in any form. In theory it forms the strongest argument for their introduction; in practice it is the most alluring of the motives which cause the child to labor and to be happy in his labor."

Mr. Frank M. Leavitt, principal of manual-training schools, Boston, being called upon to speak on the subject of supervision, said that in that city strict uniformity was not insisted on. In the development of a scheme of work the principal had proceeded deliberately with deference towards individual masters, and with consideration of individual teachers. The course of study as it stands at present is the result of two or three years' careful and concerted experimenting on the part of the teachers themselves. As a result certain lines have been established, but the teachers are allowed considerable latitude in following them. Mr. Trybom's system of cardboard work for lower grades has been introduced into seven schools, and has been welcomed by the teachers. Bench-work is in all cases taught by specialists.

Mr. Leavitt believed it to be the duty of the supervisor to put himself into close sympathy with teachers. Every opportunity should be given to teachers to get out and see other schools. The supervisor should do all in his power to help and encourage the teacher and to lighten his work.

The next speaker introduced by the president was Mrs. Mary S. Woolman, Teachers College, whose subject was

DOMESTIC ART IN THE ELEMENTARY SCHOOL.

Mrs. Woolman had observed that a feeling seemed to prevail among parents that sewing should not be taught in elementary schools. This may be true when regarded from its commercial side, or from the excessively neat work which may be demanded from the little ones. There are, however, lines of domestic art work associated with the needle which are worthy of your thought. They appeal to the interests closest to the child, and they do not require the technical skill which may injure by its demand for too neat adjustment. Will power comes through the training of the hand in this as well as in other kinds of manual work. Teachers too often do not adapt the exercise to the growing powers of the mind. Every spontaneous effort to accomplish the required task tends to the development of power, but when the teacher's will, and not the child's, has directed the effort, much of the benefit is lost. The child's interest must be utilized. His will and his judgment should appear in the model. The teacher should have high ethical aims, working for the efficiency of the child. Creative effort on the part of children should be encouraged as far as their age will allow. Again, the child's motives should be watched and directed. At first

he will want the article he makes for himself, then he will be interested in making it for some one else; lastly, he will be willing to work for the class, thus developing the social spirit.

Mr. Frank H. Ball, of Chicago, gave a brief account of the work of the University Elementary School, of which Professor John Dewey, of the University of Chicago, is the originator and director. In speaking of this unique school, he quoted the following from the *University Record:*

THE UNIVERSITY ELEMENTARY SCHOOL.

"The school as a whole is organized on the basis of using as many connections as possible between everyday life and experience and the more formal work of the school. It is assumed that the processes that educate, and the material that instructs, and the mental workings through which knowledge and discipline arise, are the same within that they are without the school walls.

"When the natural forms of experience are carried over in the schoolroom, it is found that the problem of correlation largely solves itself — it disappears. The bonds that tie various studies and truths together are the same that hold together the various occupations in which the child emerges, and the various surroundings with which he comes in contact outside the school. There is a common fund of experience out of which all grow, and to which all contribute. When subjects are not isolated from actual connection with the child's own life, forced correlation of one subject with another is not called for. Whenever a need, a motive, is felt for any special line of facts in any particular direction — as in number work, reading, writing, etc. — there is no hesitation in giving special work in that particular line. The necessity which the child feels, and the possibility of using what is gained to enrich and further some other subject, furnish all the threads of connection that are required.

"More particularly, the various forms of constructive work in kitchen and shop afford natural modes of experience and give rise to problems that can be pursued in more technical and formal fashion in other classes. At the same time they afford abundant and continued opportunities for applying whatever skill, practical or intellectual, is elsewhere gained. They introduce children to materials, to tools, to processes and modes of handling materials which connect naturally and inevitably with arithmetic and geometry, geography, mineralogy, physics, chemistry, etc. Moreover, when interrelation is made on the basis of need and possibility of application, certain subjects naturally fall together, as, for instance, geography with history on one side and with science on the other; number with constructive activities and with science; language, both in reading, spelling and writing, with all other subjects. Finally, art in music, line, and color is an indispensable mode of expressing and communicating values anywhere realized in experience."

Commenting on Mr. Ball's very interesting paper, Mr. Louis H. Galbreath pointed out in Dr. Dewey's work the development of a new thought — that the school is not merely a preparation for life, but is a life in itself. It cultivates the social spirit. The scheme meant not only the adoption of a new curriculum, but also a new management. The spontaneous activity of the University School contrasted strongly with the unreality of our ordinary schools.

Dr. McMurry said that this school, which started with activity and ended with books, overturned the idea that a child could use nothing but memory. It would be interesting to know how far the plan of the school, in which he understood that one

study gave the suggestion for another, would interfere with a regular scheme of models and sequence in the use of tools.

Mr. Ball replied that no fixed course of models had been adopted, and no regular order of tool exercises. The work was still in process of development, however, and changes would doubtless be made, but how far these would tend towards a fixed series of models it would be difficult to say.

The president considered Mr. Ball's account of Dr. Dewey's work extremely interesting, and he would strongly advise any members of the association who had the opportunity to visit the school and study its workings. Correlation at the University School was not a mere correlation of studies, but a correlation of life — of home life with school life.

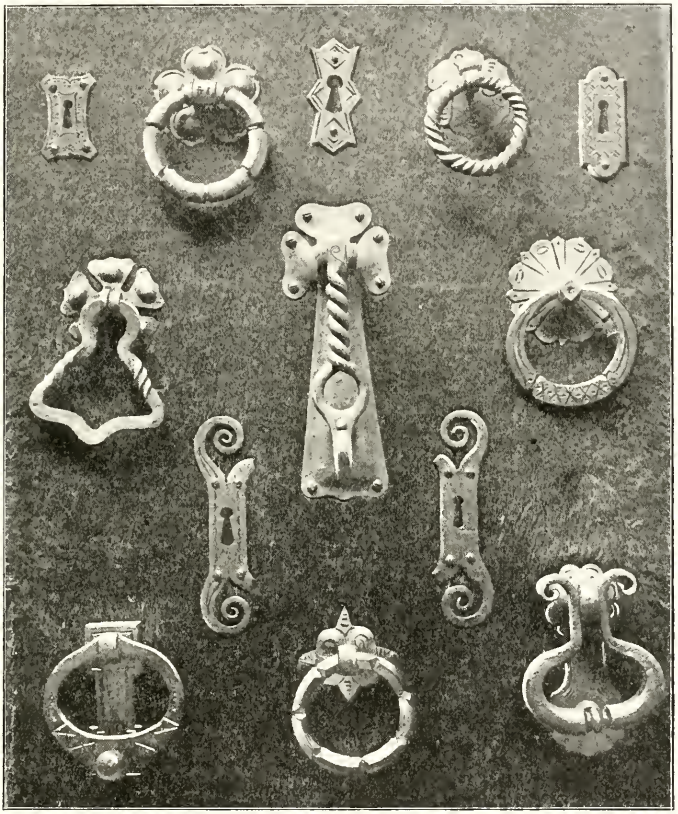
The association reassembled at 10:30 Saturday morning, when President Richards introduced Professor John M. Tyler, of Amherst College, who spoke to the following effect on

THE MEANING OF MANUAL TRAINING IN EDUCATION.

"Most of our mistakes in education are made through forgetting something always known in the search for something new. Professor Huxley has compared life to a game of chess in which the player must strive against an unseen antagonist. The function of education is to fit us to play the game of life successfully. It is not enough to stand and look on or to study books; you will never learn the game unless you play it. Every morning there comes to us a series of impressions which are followed by suitable actions. You awake with a sensation of daylight pervading your room; the thought of rising follows, and you rise accordingly. Then comes the feeling that it will be the proper thing to make your toilet in the customary manner, and the necessary action results. In response to further mental impressions you take your breakfast and go out on the street for a walk. You see a trolley car coming and hear the warning bell and you get out of the way. The morning's experience is a fair sample of life. We are constantly studying conditions and meeting emergencies. Every response to a stimulus involves muscular action, and our education should enable us to see that the right response is made to every stimulus. There are two elements of conduct — brain and muscle — the brain to give the right impulse and the muscles to give the right response. The nervous system forms the connection between impulse and action. Muscle and brain are like man and wife — when the woman determines what is to be done the man must do it. Brain and muscle are one flesh. 'What God hath joined together let not man put asunder.' The fundamental things, then, in education are to train the mind to decide right and to train the muscles to make prompt and right response.

"In past days a boy's education consisted of three parts. In the summer he worked on the farm; in spring and fall he learned some trade, such as carpentry, shoemaking, blacksmithing, etc., and in winter he went to school. This training produced strong, keen, energetic men. As times grew better and the divisions of labor came in, the time of school increased. The learning of a trade in the spring and fall was crowded out, and eventually the farm work of the summer followed it. And yet we have not made our school training any less purely intellectual than when it occupied only the winter weeks. It neglects every organ except the brain. What will be the result? In the first place, in about two more generations we shall have killed off all our girls. As another result many educated people are losing the power to act.

They are delightful in society; they know literature, history, theology, art, etc.; but when some emergency is to be met they are powerless. Ask their advice and they will give unanswerable arguments *against* every possible plan. Ask them to suggest and they will discuss endlessly, but decide on nothing. In the meantime the emergency has got to be met and uneducated people do it.



FORGINGS, PRATT INSTITUTE, BROOKLYN, N. Y.

"Manual training is part of a great movement in which it takes its place with physical training in yielding a more symmetrical development of all the powers of body and mind, but it has also its special work and place. The least of its special functions is (1) the training of the muscles which necessarily comes with manual work. Of more importance is (2) the realization of the necessity of working up gradually from humbler to higher things. Where all training has been concentrated on

the brain the motor sense becomes paralyzed. The college graduate is discouraged because he cannot leap at once into the professor's chair. The boy who would make a handsome writing case must begin by whittling a pine stick. Then comes (3) the mental training. When you develop the motor centers, you are developing the intellectual centers. In training the great back muscles you train the fundamental motor centers upon which as a firm foundation the higher centers rest. Manual training develops the powers of observation. Lastly we have (4) moral training. Manual training teaches a boy honesty and truthfulness and gives him a respect for labor.

"The beauty of motor training is that it is nature's way. In old days man made himself as unnatural as he could, but we are now beginning to appreciate the advantages of being natural. Nature is neither a friend nor a fool. In manual training we are casting in our effort with nature.

VASES TURNED AT PRATT INSTITUTE.

"Our great aim is to train a race which shall represent a civilization worthy to survive. On our educators more than on doctors, lawyers, statesmen or men of any other calling depends the civilization of the future."

The discussion of Professor's Tyler's paper was taken up by Dr. McMurry, who had nothing to say in opposition to what had been said, but would add a few thoughts in the same line. We want *behavior* of some kind as our great aim in education. The learner should be prepared to come in contact with people. Let us ask ourselves the question, Does the child correspond by nature with what we want him to be? Children are not theoretical. They want to *do* — to handle and examine everything and find out how it works. They are practical, and we would have them practical when they go out into the world to take their part in the affairs of life.

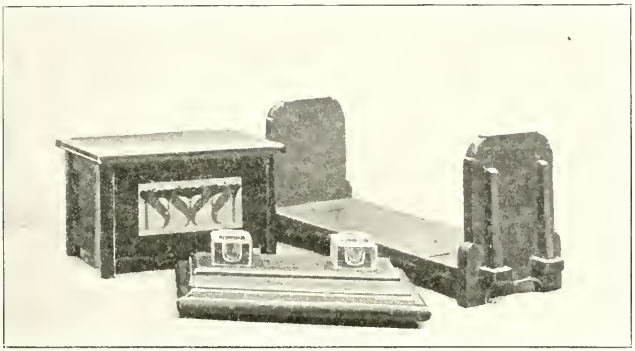
The school has opposed what is here by nature and what is wanted. Visit a country school today and you will find the child's natural activity repressed. He is forced to work with books and with books only. As manual training, nature study, etc., grow in favor and find a place in the school curriculum we are getting a remedy. In high school and college the work is still mainly with books, and the study of books is recommended for postgraduate work.

The question has been asked, Are our schools too theoretical? The speaker would reply that to a great extent they are. Our methods justify the opinion of the business man that education does not fit for life. Graduates feel the misfit when, not having been engaged in doing, they are suddenly called upon to do. Books should be a help, but not the main thing. Young children are thoroughly alive, but as they grow older they become less inclined to work. A kindergarten teacher when asked if she had ever seen a lazy child, replied that she had seen a few at five years of age, but none

at three. "But there are," remarked the speaker, "plenty at twenty-five." The schools must be prepared to meet a human tendency. Manual training takes activity at the start and continues it, and the child gets a conception of the real relation between thinking and doing.

In reply to a question as to what foundation there was for the statement that a student could carry manual training and technical work in the high school without sacrificing anything of the other studies, Professor Williston cited several cases to show that he believed the statement well founded. In the University of Ohio no academic work was sacrificed for shop-work.

Mr. T. W. Mather, principal of the Boardman School, New Haven, said that boys in his school were doing the full amount of academic work, in addition to their shop-work and drawing, and he would not hesitate to place them in competition with boys



JOINERY AND INLAYING, PRATT INSTITUTE.

from any high school in the field of academic work. Five boys were then taking the "final" and nine the "preliminary" examinations for the Sheffield Scientific School of Yale. [He has since reported that all of these boys passed satisfactorily.]

Mr. G. H. Bryant, Newport, cited his experience in support of the same view. Manual training had been added to the regular curriculum in the grammar schools of Newport five or six years ago, and had proved a complete success.

TECHNICAL OR GENERAL EDUCATION — WHICH?

The discussion of the question, "Should the Manual Training High School aim at Technical or General Education," was then taken up by Mr. Bryant. He had written to secretaries of technical colleges and to teachers of shop-work and drawing with a view to ascertaining what value was attached by the technical colleges to preparatory work in manual training. The replies had not been as favorable as he had hoped. One was of the opinion that shop-work and drawing should be replaced by more thorough academic training. Others held that preparatory work in these branches was often detrimental rather than helpful. All replies seemed to indicate that high-school work along these lines was of doubtful value as a preparation for the technical school. Mr. Bryant would not have manual-training high-school work conducted on the lines of

preparatory work. We have a mission apart from this. The classics have been replaced with shop-work and drawing to broaden the field of choice. There is a field for the manual-training high school in preparing its graduates for life.

Mr. Mather had supposed that the question on the program referred to the character of the work to be done. At the Boardman School there are two courses. One "Scientific," especially intended for boys wishing to enter the Yale Scientific School, and the other called the "General," for those whose school education must end upon graduation. The former has an especial value in New Haven, because no manual work is given to Yale students, and, possibly for this reason, the Sheffield authorities are heartily in favor of such preliminary training. The course also has proved important by giving educational standing to the school, for before it was introduced the public believed that manual work was the principal feature and academic work but of secondary importance in the school. Mr. Mather believed the true function of a manual-training high school, however, was to prepare boys for life. The education required by those who enter college certainly should differ from that we give to those who cannot find time or afford to go there, and we should not sacrifice the many for the benefit of the few.

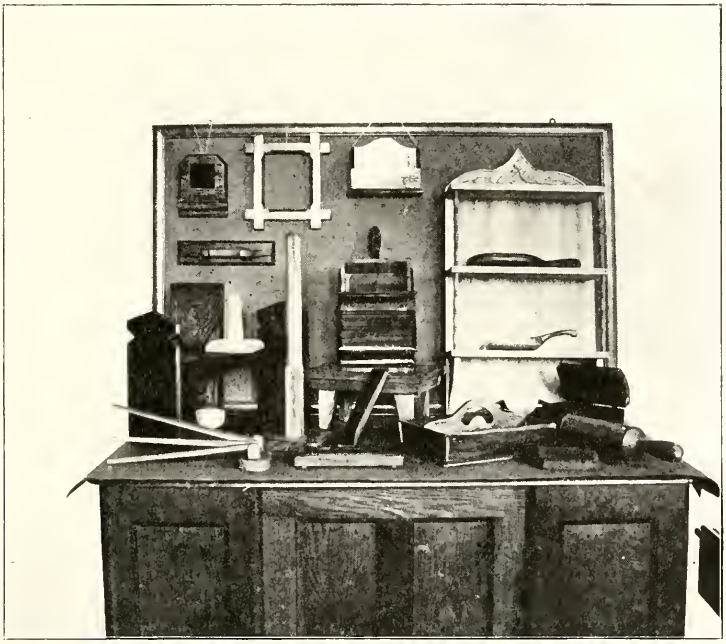
It is difficult to make a distinction between what is technical and what is general. Much depends upon the methods of instruction used. Shop processes of all kinds are essentially technical in nature, but we give them not for the purpose of teaching a trade, but as a matter of general education. At the same time the knowledge so gained may be a decided help in enabling a boy to find a position upon leaving school. The great trouble with the education given at the ordinary high school is that it is of so general a character that a boy can find nothing to do after having finished it. When asked, "What can you do," he can give no satisfactory answer. Application should accompany theory; the technical should go along with the general; and we should give enough of the former to enable a graduate to find work, and at the same time give a broad culture which will enable him to appreciate what is good in art and literature and science.

At the Boardman School the mechanical drawing is of a character designed to lay the foundation for specialization in some branch of mechanical work, and it has opened the door to many positions.

Professor A. L. Williston, of Pratt Institute, Brooklyn, added his testimony to the fact that the technical college regards high-school preparatory work as of little value. The nature of the college work is different, both in shop-work and drawing. The student who has taken the high-school preparatory course is excused from little in the college. Will manual training fit boys for life? That is the true test. There is a demand for young men who can do something — especially in mechanical lines. The demand is not merely for draughtsmen, machinists, etc., but rather for men of energy and originality, who can do things which have never been done before — who have learned to bridge over the gulf between thinking and doing. The high-school course should not be too technical. It should be planned on lines calculated to arouse intense interest on the part of the student. Professor Williston looked forward to the day when the manual-training high school would be the only high school.

Several other members of the association contributed to the discussion of this interesting question, all apparently agreeing that the manual-training high school should aim at general rather than technical education. The discussion was closed by Professor Richards. His remarks were, in part, as follows:

"It seems to me that there is one element which undoubtedly affects the general attitude towards the manual-training high school that needs to be carefully examined in order to prevent misconception and confusion. It is unquestionably true that there has been developing throughout our country of late years a demand for technical training of a grade below that of the engineering school, of a kind that will prepare young men for positions as designers, draughtsmen, and superior workmen, and even-



WOODWORKING, GRAMMAR SCHOOLS, NEW YORK CITY.

tually as foremen and superintendents; indeed, for all that large class of positions which demands special scientific and mathematical knowledge in addition to thorough technical training, but does not require the advanced theoretical instruction given in schools of technology.

"While we as a country stand at the front as to the development of high-grade engineering schools, we are almost entirely wanting in schools of this other class, such as are so frequent in the older countries.

"The demand for this kind of school has begun to be felt during practically the same period in which the growth of the manual-training high schools has occurred. And the existence of these latter schools already organized and in some cases splendidly equipped and with their aim still unappreciated by the larger public, has naturally given rise to the question: 'Why should not these schools serve for this new need?'

"That technical schools of the secondary grade will come into plentiful existence in the future is a matter of little doubt, but that the manual-training high school will come to serve this function is an entirely different proposition, a proposition that involves an entire change in the original aim, spirit, and methods of these schools.

"Considerable emphasis has been laid in the discussion upon the question as to whether the manual-training high school affords the best preparation for schools of technology. The point has been raised that representatives of the engineering schools have criticised the shop-work training of the students coming from the manual-training schools as not being thorough and not equal to the training given in the engineering-school shops. This, in my judgment, is not a competent or intelligent criticism of the manual-training high school. The object of shop-work instruction in the engineering school is to obtain as thorough a knowledge as possible of tools, processes, and materials, an aim absolutely distinct from that of the manual-training high school, and one indicating a difference that requires not only a different spirit in the shop-work of the two schools, but essentially different courses of instruction.

"This difference in fundamental aim is so great, it seems to me, as to render it impossible for a wisely ordered manual-training course to compete as the equivalent of an engineering-school course of shop-work. Indeed, it would be a very misguided policy that would attempt anything of the kind."

"The next paper read was that of Miss M. A. Pinney, of New Haven, on Manual Training in the Primary Grades. An interesting account of the work in the primary grades in New Haven was given, indicating the tools, materials and methods employed there, and the results obtained. A similar description of the primary work in Yonkers, N. Y., was given by Mrs. E. S. Knapp, after which the discussion was taken up by Mr. Kenyon, Dr. Haney, and others. That primary grade work was held to be a very important factor in the scheme of manual training was shown by the interest taken in this discussion."

BUSINESS MEETING.

This concluded the discussion of educational topics, and the business of the association was taken up. The reports of the secretary and treasurer were read and adopted, the treasurer's report showing the finances of the association to be in satisfactory condition.

The secretary then read a summary of the replies to the following questions which had been sent to members of the association:

Do you believe that the National Educational Association offers the best field for a national organization of manual-training workers?

Do you favor the continued existence of the American Manual Training Association on its present lines?

Do you favor instead the organization of sectional associations?

Do you favor the organization, and would you become a member, of an Eastern Manual Training Association?

The summary showed that a considerable majority were in favor of changing the title to "Eastern Manual Training Association." On being put to vote, this change, with the other proposed amendments, was adopted, the matter of joining a manual-training department of the National Educational Association being left to members individually.

The meeting then proceeded to the election of officers, with the following result:

President, Robert C. Bates, Elmira Reformatory, Elmira, N. Y.

Vice President, Frank M. Leavitt, Supervisor of Manual Training, Boston, Mass.

Secretary and Treasurer, Walter J. Kenyon, State Normal School, Lowell, Mass.

Members of Executive Committee: William G. Roberts, Supervisor of Manual Training, Cleveland, O.; Jas. P. Haney, M.D., Supervisor of Manual Training, Manhattan, New York City; Gustaf Larsson, Sloyd Training School, Boston, Mass.

A motion was passed authorizing the appointment of a committee to undertake the publication of an enlarged edition of the bibliography issued by the association in 1898. Another resolution empowered the Executive Committee to have printed in the annual pamphlet a list of members of the association.

It was unanimously agreed that the association accept the invitation of Mr. W. E. Roberts, on behalf of himself and other representative men in educational circles in Cleveland, to hold the next annual meeting of the association in that city.

THE EXHIBIT.

The meeting was marked by a very fine display of work, illustrating the courses used in the various contributing schools, and being, in most cases, specimens of pupil's work. The exhibit was arranged in the spacious kindergarten rooms of the college, where the large number of visitors gave evidence of its attractiveness.

The character of the work in general showed progress in all lines, especially in the adaptation of tools and exercises to the capabilities of children in the primary and lower grammar grades. There appeared in all grades a tendency toward the adoption of more interesting models instead of the abstract exercises once in such general use.

The samples of kindergarten work from Hampton Institute may be mentioned as a novelty in manual training for young children. Pieces of wood and tin are supplied, which the child is taught to nail together to form miniature articles of furniture, etc. Basket-work is also included in the course.

The exhibit of the New York public schools was noteworthy as being composed entirely of models outside of the schedule of prescribed exercises. Time is allowed to each boy during the half-year term to make something of his own selection and preferably of original design. That such a plan may be carried out with a very creditable degree of success in a great city system with its large classes and necessary limitations was well illustrated by this exhibit.

WILLIAM F. VROOM,
New York, N. Y.

MANUAL TRAINING AT THE LOS ANGELES MEETING.

THROUGH the active interest of the chairman of the local committee one of the most commodious and centrally located of the convention halls was placed at the disposal of the Department of Manual and Industrial Education. The first session opened at three o'clock on July 12, with a paper on "The Manual Training Teacher," by President Walter A. Edwards, of Throop Polytechnic Institute of Pasadena, California. Among other things President Edwards said:

"In any scheme of education the teacher is of prime importance, for it is the teacher that makes the school, and not books, apparatus, and methods. Prudence, therefore, dictates that we make sure that adequate and proper means of preparing teachers are provided, and the question arises, where, in normal schools or in special

sloyd training schools, do those who expect to teach sloyd find the best preparation? If, in seeking an answer we consider, first, the needs of the child, we find that for the sake of conserving the essential unity of the school curriculum it is well if the sloyd teacher has studied sloyd as an integral part of a regular normal-school course. In this way he has studied it in its normal position in the curriculum, and he understands its relations with other subjects. But special schools for sloyd training are needed, for not many normal schools teach sloyd; and again the would-be sloyd teacher must give much more time to this subject than to the others in this curriculum, because sloyd requires much further research and experimentation, being still new and not fully adjusted in its place in the curriculum.

"The manual-training teacher must be first of all a teacher—everthing in education and culture and character which we would have other teachers be. But he must also be a good mechanic. Unworkmanlike work is not educational. The teacher must be a good cabinetmaker if he is to be a good character-maker. For the more advanced shopwork, preparation may be made either in special training schools where a study is also made of the underlying pedagogical principles, or in a technical school, where the pupil has a better outlook into the domain of mechanical enterprise and where he is conscious that he is working with the elementary processes and principles on which rests the whole sublime structure of mechanical achievement.

"In a manual-training school the teacher of book subjects must sympathize with and direct more varied interests and ambitions than the teacher in schools without manual training. He must maintain a higher interest in his work and keep a firmer hold of the recitation that the restless mental activity of the class may be profitably directed.

"There is needed in a manual-training school a higher degree of coöperation and a fuller mutual understanding among all the teachers than is exactly necessary in other schools. The larger variety of interests and activities with their comparatively unfamiliar interrelations, makes the problem of unity of action more difficult in a manual training school. Such a school demands much of its teachers, but gives them a correspondingly greater reward in a larger present recognition and a more lasting influence on the character and lives of the pupils."

After brief discussion of this paper by the acting president, Charles H. Keyes, of Holyoke Mass., Principal Vinton S. Paessler, of the Barlow School of Industrial Art at Binghamton, N. Y., read a paper on

THE EDUCATIONAL VALUE OF METALWORKING

in which he said:

"Skill and art in metalworking have always been so necessary to human existence that it is impossible to discover when the metallic thread began to be woven into the web of progress. History credits metalworking with having the first recorded teacher, and the invention of the process of smelting iron ore as being the beginning of civilization. Our condition without the use of metal would be most pitiable. The wheels of progress would cease to turn. The schoolhouse would fail. The telegraph, ocean cable and steamboat would be unknown. The microscopic and telescopic worlds would be hidden from us. This convention would be impossible.

"Metalworking is the parent industry to which every other industry primarily owes its existence. It is the one industry that makes America great in the eyes of the world today. But is commercial prosperity necessary to the ideal civilization, or does

it only indicate it? Metalworking is necessary to an appreciation of the wonderful furnishings of this world. A little knowledge of metalworking is necessary to woodworking. If the condition of a tool, specially adapted by its form to do a certain class of work is not appreciated, the work done by the use of the tool will be of little educational value. This is true wherever tools or instruments are used. Care of tools is just as much a part of metalworking as a penny saved is money earned.

"Wirework, bent-iron work, sheet-lead development, etc., have a wealth of possibility in forms of beauty, curves of grace and lines of strength. Metal-spinning, sheet-metal work, chipping and filing and machine-tool work, open up a wide field for the development of power, appreciation and adaptation. The blacksmith is an old friend of accepted educational value. To the founder and metallurgist belong some of the greatest triumphs of the metal-worker, and 'metallurgy is the glory of chemistry.' Metalworking is valuable education, and greatly aids in 'the development of the ability to appreciate and choose the best things.'"

Discussion of this paper was led by Mr. Frank H. Ball, of Chicago, Ill., and Mr. W. H. Buchanan, of Stockton, Cal., after which announcement of the first issue of the new MANUAL TRAINING MAGAZINE was made by the secretary, Jas. E. Addicott. Pledges of support were received and expressions of congratulation on the inauguration of the enterprise.

The following committee on nomination of officers was appointed: C. A. Kunou, Los Angeles; F. H. Ball, Chicago; V. S. Paessler, Binghamton, N. Y.

The chair then reported that an application for the separation of this department into two departments to be known respectively as the Department of Manual Training and the Department of Industrial Education was before the Board of Directors of the N. E. A., and called attention to the fact that while there seemed fixed determination to create no more new departments, the first step might be taken at this meeting by securing a change of name of this department. Mr. F. H. Ball reported that anticipating the creation of a Department of Manual Training in the N. E. A., the American Manual Training Association had at its recent meeting in New York voted to disband.

After some discussion the secretary was instructed to lay before the Board of Directors of the N. E. A. a petition from this department, asking that its name be changed and it be henceforth known as the Department of Manual Training.

The second session of the Department of Manual and Industrial Education opened with a paper entitled

CONSTRUCTIVE WORK IN ELEMENTARY SCHOOLS,

by Miss Gertrude E. English, principal of Farren School, Chicago, Ill.

The following is a synopsis of Miss English's paper:

"1. The foundation of the movement for the more general introduction of such work into elementary schools: (*a*) the necessity of providing for the child a motor outlet following sensation; the desire on the part of the teacher for the objectification of the child's own image, secured by him through his senses. This image is frequently faulty; only by holding up the faulty image for comparison with the true one can the teacher expect the child to correct his mistakes; (*b*) the additional avenues for expression and the multiplication of paths result in greater certainty in regard to the ability of the child to call up his image at a future time; (*c*) the great industrial changes have deprived the child of the opportunity to gain skill in handwork in the manner in which his forefathers gained it. Specialization and originality

must be secured. Society demands that our youth be given some training in hand-work.

"2. Principles underlying the work: (*a*) the teacher's standpoint. Synthesis should be the watchword rather than analysis, wholes rather than parts; (*b*) the child's interests should be considered. The work should not be systematized in a course of study, but should be permitted to shift with changing interests; (*c*) correlation should be kept in view. A class reading 'Hiawatha' may wish to make wigwams, canoes, moccasins, deerskin boats, bows and arrows; a group studying the productions of a country may desire to try to spin and weave, thus gaining some knowledge of its textiles. Carpenter's 'Asia' gave a certain class the impetus to make the jinricksha, the Chinese wheelbarrow, the street lamps, the counting machine; (*d*) the accurate, finished product should not be expected. Imitation and mere reproduction should be discouraged.

"3. (*a*) Materials and tools should be such as can be readily secured. There is no better way for teaching economy and the inventive faculty than in the work which enables the child to make something useful or beautiful out of what he usually throws away; (*b*) suggestions for different grades.

"4. Advantages gained by the practice of such work: (*a*) sense training by means of contact with materials which are being used for a definite purpose; (*b*) familiarity with form, size, and color is secured; (*c*) by permitting the child to carry his product home, the interest of parents is enlisted; (*d*) a vast array of mathematical facts is gained in connection with objects concerning which these facts are interesting."

Mrs. C. L. Place, of the State Normal School at San José, Cal., led the discussion of this paper.

CORRELATION OF MANUAL TRAINING, WITH OTHER SCHOOL SUBJECTS

was the subject of a paper by James E. Addicott. He said, in part:

"Manual training, as treated in this article, is recognized as a fifth branch of study, which, if properly adapted to teaching of the other four great branches, language, science, history, and mathematics, is destined to become one of the greatest educational factors in correlating all lines of school work. To this end we advocate the training of the bodily powers as well as the mental; not only that the student may have the opportunity to do something better, but that he may thereby think something better.

"Manual training means the utilization of the physical activities of the student in getting experiences necessary to the acquisition of knowledge. The time has come when intelligent hand-work is recognized as contributing to moral and intellectual development as fully as the older plan of studying books. With advancing civilization comes a new environment; with this new environment come new necessities; with new necessities should come a course of study that will enable the student to adjust himself to his changed environment. Thus we believe that the future life work of the student should influence the course of study.

Mr. P. M. Fisher, of Oakland, Cal., and F. H. Meyer, of Stockton, Cal., participated prominently in the ensuing discussion.

Miss Anette Johnson explained "The Manual Training System in Los Angeles."

The committee on nomination of officers reported the choice of the following persons: For president, Charles H. Keyes, of Massachusetts; for vice president,

Charles A. Bennett, of Illinois; for secretary, W. H. Buchanan, of California. Mr. Keyes protested against the adoption of the report so far as his nomination for the office of president was concerned, but despite the protest the motion to adopt the report was unanimously carried, and President Edwards, of Throop Polytechnic, who put the motion, declared the gentleman above named duly elected.—Reported.

BREVITIES.

THERE seems to be a lively interest in manual training along the Pacific coast.

THE manual-training work from Indian schools attracted much attention at the Los Angeles meeting.

"I heard of one school in a thinly settled district in California in which the boys were so desirous of obtaining a printing press that they began to work a deserted gold mine in order to obtain the necessary purchase money. Now they propose to dig more gold in order to establish woodworking in their school."— B.

CLINTON U. TRUE, who has been in charge of the manual-training work in the city of Moline, Ill., has accepted a position in the St. Louis Manual Training School. His place is to be filled by Louis R. Abbott, of New Britain, Conn., a graduate of the Worcester Polytechnic Institute.

CHARLES H. KEYES, president of the Manual-Training Department of the National Educational Association, has resigned his position as principal of the Holyoke High School to accept the superintendency of the public schools of the South Division of Hartford, Conn. Before coming to Holyoke Mr. Keyes was president of the Throop Polytechnic Institute of Pasedena, Cal.

THE Louisiana Art Teachers Association is making a most commendable effort to have the value of manual training recognized by the school officials of the city of New Orleans. As the result of a resolution adopted June 1, 1899, the New Orleans members of the association are circulating a petition requesting the board of school directors to introduce some form of manual training into the public schools of their city. The sheets containing the signatures will be returned to the secretary in November and then presented to the board.

THE United States educational exhibit for the Paris Exposition is being prepared under the direction of Mr. Howard J. Rogers, who was in charge of the New York state educational exhibit at the Columbian Exposition. Mr. Rogers is making an effort to have manual training well represented in this exhibit, but is being very much hampered by the lack of sufficient space. He has been forced to the decision that the manual-training exhibit must consist of photographs of courses and equipments instead of the objects themselves. In this way, however, he can show a more representative exhibit in the limited space at his disposal.

A LETTER from a trustee of one of the oldest colleges in the middle West contains a paragraph that well illustrates how the manual-training idea is gradually working

its way even into the minds of those who have been supposed to think that there could be no education but that provided in the time-honored classical course. After pointing out that "it cannot be hoped that farmers will always contribute to a college which educates youth not to be farmers" and then deploring the fact that "trades and education are divorced," he says: "The true way to keep the mechanical trades and education in sympathy, one with the other, is to teach the fundamental principles of mechanical trades in school. More than this; the true way to educate a youth is to exercise him in such a variety of ways as to let him come to know his own aptitudes and thereby discover himself." He then urges that a manual-training building be added to the venerable structures on the college campus.

AN EQUIPMENT EXHIBIT.

Mr. Editor:— One of the chief purposes of a manual-training exhibit is to furnish suggestions of courses or methods of carrying on the work. To our manual-training meetings come not only those who have long been identified with the work and who study an exhibit from the standpoint of educational philosophers, but also those who are new to the work and who seek suggestions to enable them to enrich their courses and to extend their equipment. School superintendents come, wanting to see what is being done and the means by which it is accomplished.

An equipment exhibit would afford manufacturers an opportunity to bring their tools to the notice of those especially interested, and so, perchance, enable them to introduce their tools in new schools and communities. As a result of such a display, perhaps some inventive manufacturers would be led to produce for us more perfect appliances. What teacher is perfectly satisfied with any of the available compasses for grammar grades, or with his pencil sharpener, or with his bench-vise? I was much surprised not long since that I could not find in one of our largest cities nor among some of our best firms a good school ruler graduated to eighths of an inch only. Would it not be to the manufacturer's interest to know just what tools we teachers find most suited to school children? Manual training occupies a growing place in the educational world, and its interests will demand an increasing supply from the manufacturing world.

To accomplish the purposes of such an exhibit, samples of tools and materials should be so arranged that visitors could actually handle and test them by use. Sample drawing tables could be supplied with different kinds of paper and pencils so that selections could be made with reference to particular uses. Benches, and perhaps lathes, could be arranged in a similar manner. Model outfits for paper-work, slip-work, whittling, bent-iron work should be selected and arranged for exhibition by those who have taught these subjects. Photographs of manual-training rooms might be used to show the adaptability of tables, desks, or benches to different school grades and ages of pupils.

I believe such an exhibit would be interesting and profitable.— HARRIS W. MOORE, *Schwab Manual Training School, Homestead, Pa.*

EDITORIALS.

Our first word is one of appreciation. We are grateful for the prompt and hearty coöperation we have met in every quarter in organizing the Magazine. It is such assistance that makes difficult work easy. First of all we are grateful to those whose names appear on our list of contributors; their indorsement of our plan made possible everything else that has been done, and upon their continued support will depend the success of the Magazine. We appreciate the liberal response of our advertisers, and the encouraging letters received from subscribers. At present we are especially indebted to Mr. James Hall, of Massachusetts, for what we consider a particularly appropriate cover design, and to Mr. William F. Vroom for his report of the meeting of the American Manual Training Association. He has saved from oblivion the essentials of one of the most profitable discussions that has ever taken place at a meeting of manual-training teachers.

The Magazine is honored in having its first leading article by Secretary Hill, of Massachusetts. Mr. Hill was born in Biddeford, Maine in 1841; he graduated from the Biddeford High School at the age of fifteen, and from Bowdoin College at twenty, having worked his way through by teaching school during the long winter vacations, then in vogue. After graduation he became principal of the Limington Academy, and later of the Biddeford High School, in which he had been a pupil only five years before. He then studied law for two years, intending to follow in the footsteps of other noted men from Maine, but his inherited aptitude for teaching, and the success he had already won in that field combined to overbalance his wish to become a lawyer, and he accepted the principalship of the Milford (Massachusetts) High School in 1870. From this place he was called to the Chelsea High School and then to the head-mastership of the English High School of Cambridge. It was here that he rose to prominence among the schoolmasters of New England. The building which he planned in Cambridge has been the model for many others, and what is of more importance, the school within this building doubled in size and more than doubled in its uplifting influence upon the boys and girls of

Cambridge. While in this school Mr. Hill was closely associated with Mr. Harry Ellis in the organization and development of the Cambridge Manual Training School for boys. But it was in 1893, as the first head-master of the Mechanic Arts High School in Boston that Mr. Hill became known to teachers of manual training generally In this position, however, he was not allowed to remain long, for in the following year he was chosen secretary of the Massachusetts State Board of Education, which position is practically that of State Superintendent of Schools. Since Mr. Hill's election to this position the State of Massachusetts has placed on its statute books a law requiring manual training to be taught in the high school of every city of more than twenty thousand inhabitants in the state. Mr. Hill has encouraged manual training in smaller high schools and in the elementary schools, so that today Massachusetts is easily ahead of any other state in the Union on the way to making manual training an integral and permanent part of its system of education.

During the past summer each of our national organizations of manual-training teachers has adopted its rightful name. The Department of Manual and Industrial Education of the National Educational Association, is henceforth to be known as the Department of Manual Training, and the American Manual Training Association has become the Eastern Manual Training Association. In other words, there is now only one national organization of manual-training teachers and that is a department of the National Educational Association. It is hoped that other sectional associations will be formed which shall be similar in scope to the Eastern Association. For instance, there ought to be at least three others—one for that section of the country whose business center is Chicago, one in the South, and one on the Pacific slope. The territory has already begun to be subdivided still further by manual-training departments of state teacher's associations, and by such organizations as the Chicago Manual Training Association, and the Minneapolis Manual Training Teacher's Club. These changes mean better work covering a broader field.

In order to appreciate the significance of these changes it will be necessary to look back a few years. At the meeting of the National Educational Association in Minneapolis, in 1875, a department of Industrial Education was established as the result of a petition signed by twenty members of the association, and presented to the Board of

Directors by Professor S. R. Thompson, of Lincoln, Neb. We learn from the president's address at the first session of the department in Baltimore, in 1876, that the chief aim of the department was to discuss "questions growing out of the relations of industrial education to our various productive industries." Among the leading questions for discussion at the first meeting we find, "What can be done to secure a larger proportion of educated labor among our producing and manufacturing classes?" "What are the legitimate duties of an agricultural professor?" "Drawing as an element of advanced industrial education." At the second meeting in 1877 we find "Relations of the common school to industrial education," "Systematic labor in industrial education," and "The Russian system of mechanical art education." Such topics were discussed each year, until 1882, when what was essentially a new note in the department was struck by Dr. C. M. Woodward, of St. Louis, who began his address on "The function of an American manual-training school," with this quotation from Emerson: "We are students of words; we are shut up in schools, and colleges, and recitation rooms, for ten or fifteen years, and come out at last with a bag of wind, a memory of words, and do not know a thing. We cannot use our hands, or our legs, or our eyes, or our arms." During the next few years addresses were given by such men as Colonel Jacobson, of Chicago; Dr. Felix Adler, of New York; Professor Ordway, of New Orleans, and Mr. Charles H. Ham. All this discussion seemed to reach a climax in that memorable debate at Nashville in 1889, in which figured so prominently Dr. Woodward and Dr. Harris.

In the report of this meeting of 1889, just ten years ago, the word Manual appears with Industrial for the first time in the name of the department. Since that time the officers of the department have usually been selected with reference to satisfying the desires of both the manual-training teachers, and those especially interested in the work of the colleges of agriculture and the mechanic arts. The programs, too, have been made up with the same end in view, and have often failed to satisfy both classes. This has been true up to the program of the Washington meeting in 1898, when the manual-training part of the program was furnished by the American Manual Training Association. At that meeting a resolution was passed requesting a division of the department into two departments, to be known respectively as the Department of Manual Training and the Department of Industrial Education. This resolution, which was introduced by Professor

Richards, of Teachers College, the president of the American Manual Training Association, was passed in order to open the way for uniting the forces of both organizations under the banner of the N. E. A. When the matter came up before the Board of Directors at Los Angeles it was thought that, inasmuch as the manual-training element has been so much more in evidence during the past few years, the wisest plan was to change the name of the department to Manual Training, and if a Department of Industrial Education should be needed later, it might be formed when the necessary evidence was presented. This suggestion met with the unanimous approval of the department, and action in accordance with the suggestion was then taken by the Board.

This change, which is supposed to mean much more than a change in name, has come about almost wholly on account of what has taken place in the American Manual Training Association. This association was formed in Chicago in 1893, partly as a protest against defects, either real or imagined, in the Manual and Industrial Department of the N. E. A., and partly because it was believed that a small organization of persons actually engaged in teaching could do more effective work for the cause of manual training than a larger and less exclusive body. The name given to the organization was the Manual Training Teacher's Association of America, and only those who had taught manual training for one year or more were admitted to membership. The first meeting in Philadelphia was so widely advertised that a large number of persons came and applied for membership who were not eligible. The result was a change in the name and the constitution of the organization. This caused much confusion. The next meeting, which was in Chicago, was very small, but since that time the association has gone steadily forward, and during the past three years its meetings have been, by far, the best manual-training meetings of the year. But the association has not been, in fact, a national association since the Chicago meeting; it has been supported and controlled by eastern men. The anomaly was becoming more and more apparent. The feeling, too, was growing that, the association being isolated, its members were losing the inspiration and help from contact with teachers in other lines of work which might come to them if their association were connected with the great national organization of educators. Moreover, it was thought by some, that if the members of the association were to become active workers in the National Educational Association, more effective work might be done in emphasizing the

fact that manual training is not an isolated or "tacked-on" subject, but an integral and vital part of school work. For these reasons the officers and influential members of the association have sought to bring about what has now been accomplished — a single national organization in which every teacher of manual training in the country may feel a real interest, and, in addition to this, the first of what we hope will be many strong sectional associations, coöperating with this national organization.

REVIEWS.[1]

Drawing in Four Foreign Cities.—A report by Henry T. Bailey, State Superviser of Drawing, Massachusetts. This is a valuable report in readable form. The drawing work of the cities of Rome, Berlin, Paris, and London is taken up in brief review, the leading characteristics of the work in each city being clearly pointed out. In his summary Mr. Bailey says: "From visiting the schools of these four cities I received the impression, first, that the spirit of the schools is a reflection of the spirit of European civilization — a civilization in which the old monarchical idea is still dominant, in which the habit of submitting unquestioningly to constituted authority is so ingrained that the common people doubt the right of the individual to think for himself. The teaching is dictatorial, dogmatic, mechanical, unsympathetic. The individual child is of no more value than an individual soldier. I found in the schools none of that overflowing delight in school work, that spontaneity, that enthusiasm, that free manly courage of our smiling, rosy-cheeked children which thrills and inspires the teacher." However, Mr. Bailey was much pleased with some of the manual-training work of the Paris schools. After speaking of "an evident utilitarian tendency" and "a charming esthetic quality" in the mechanical drawing where manual-training courses have been introduced, he adds, in a footnote: "The manual training in some of the Paris schools is superior to anything I have seen in this country. The models are at once simple, practical, and thoroughly artistic. The courses in cold metal working are especially attractive. The kit is inexpensive, and the results daintily beautiful."

Thirty-First Report of the Principal of Hampton Institute.—The *Southern Workman* for July, 1899, Hampton, Va. The healthy, vigorous growth that has taken place in the manual training and trade work at Hampton during the past two years must be very gratifying to those who have been laboring so long to provide the best kind of industrial education for the negro. Dr. Frissell's report shows that the

[1] NOTE: Readers of the MAGAZINE are urged to send to the editor any printed matter pertaining to manual training and drawing. Pamphlets, reports, circulars of information, and marked copies or clippings from local newspapers are always welcome. They will not all be reviewed in the above column, but they will all be helpful to the editor in his work. They should be sent as soon as published.

days of hesitating experiment are past at Hampton, and that recent actions have been taken with full assurance of satisfactory results. Perhaps the secret of this is found in Miss Hyde's report on academic work. She says: "The South especially needs men at the head of these schools who understand the distinction between the terms manual training and industrial education, and who also understand the relation of academic training to them both." Hampton has evidently come to appreciate this distinction and is now using both manual training and industrial education in an effective way. "From the kindergarten up through the senior class of the normal department there is now a carefully planned course of manual training." With reference to its relation to academic work, Miss Hyde says: "There is still much to be done towards a successful correlation of our work, and we feel that our work in the schoolroom will be thoroughly successful just in so far as it helps the students to carry out successfully their chosen occupations, prepares them for right living, and above all makes of our young people men and women of force and character. In close touch with our schoolroom work is our manual training, the benefits of which are more and more apparent each year." When every student who starts to learn a trade has a good foundation of manual training the problem of trade instruction becomes greatly simplified. Teaching trades without such foundation is like teaching bookkeeping to a boy who has had no instruction in arithmetic or penmanship: it may be possible but it is neither convenient nor pedagogical.

Manual Training Courses.—Teachers College, Columbia University, New York City. An attractive booklet containing six half-tone illustrations of manual-training courses pursued in the Horace Mann School, the school of observation and practice connected with Teachers College. The illustrations are marked as follows: (*a*) Knife-work, fifth and sixth grades; (*b*) Joinery, seventh grade; (*c*) Joinery, eighth grade; (*d*) Joinery, first year, high school; (*e*) Turning, second year, high school; (*f*) Forging, third year, high school.

Illustrations of Drawings and Shopwork.—The Chicago Manual Training School, the University of Chicago, Chicago, Ill. Fifteen illustrations of pupils' work, and a summarized statement of the present occupations of the 661 graduates of the school. The illustrations are from samples of work in freehand drawing, architectural drawing, machine drawing, cabinet work, pattern making, forging, and machine construction, including the famous tower clock built at the school a few years ago.

Circulars of Information.

The California School of Mechanical Arts, San Francisco, Cal. Contains cuts showing floor plans of buildings, outlines of a three-year preliminary, or manual-training high-school course, and of fifteen trade and technical courses.

Hampton Normal and Agricultural Institute, Hampton, Va. Outlines of courses; excellent half-tone illustrations of rooms in the new trade school building and the new building for domestic science and agriculture.

Manual Training Department, Teachers College, New York City. Outlines of courses leading to the departmental diploma. Manual-training fellowship.

Vacation Schools and Play Schools, New York City. Leaflets giving outlines of courses of study in kindergartens, primary schools, and grammar schools.

Bradley Polytechnic Institute, Peoria, Ill. Gives outline of a new, six-year mechanic arts course.

MANUAL TRAINING MAGAZINE

JANUARY 1900

SOME ASPECTS OF MANUAL TRAINING.

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I.

THE Editor commands me to make my contribution to the discussion of the place of manual training in a system of education ; and I must set about my task by speaking of a few principles of mental development freely recognized in current opinion, I believe, and which, it seems to me, should be kept in mind in a consideration of this subject. To begin with, I suppose it is not excessive to say that modern evolutionary science has shown a more or less close correspondence in main features at any rate between the unfoldment of the mind of the child and the evolution of mentality in the race ; in growing into possession of the various attributes of mind the individual must follow the order in which they were developed in racial history. It does not appear, though, that heredity confers upon the child definite (to use Morgan's term) mental capacities except in respect of a few primary instincts. Thus the child could never acquire the idea of a tree from racial inheritance alone ; what is gained from this source is a sort of basis or outline which must be built upon by experience in the life of the individual. The reactions of ancestors toward this particular object have doubtless left in the nervous system more or less obscure reminiscences which are passed on to each new member of the race, and these are developed, so to speak, by his own contact with the object. But post-natal experience in itself cannot secure mental growth in the child ; unless heredity contributes its share, the psychical structure can never be made complete. This is demonstrated in those cases where arrest has occurred in the progress of mind from birth to maturity. The individual may be surrounded with an environment

adapted to foster continual evolution, but its stimulations meet with no appropriate response ; heredity has not contributed the mechanisms which are essential for the reception and utilization of experience. This fact may be observed also in the case of normal children, as we say, who are reared under the same environing influences ; in one case the ascent of mind may be much more rapid than in the other. I have been following the development of two children in whom this law is strikingly shown. One is, in comparision with the other, adapting himself very slowly indeed to his environment, and the reason is apparent ; it is due to congenital defect which has hindered growth — that is, it has impeded the process of recapitulation of phylogenetic accomplishments. The one child is receiving his bequest from the race much more tardily than his fellow, and so he cannot respond to educational agencies with equal fullness and rapidity. The point I wish to make is that while ancestral memories, so to speak, do not contribute to the individual precise mental functions to any great extent, yet they determine the degree to which education in the form of stimulations from the environment shall take effect — the readiness with which growth in any direction shall occur.

One of the principles of ontogenetic evolution which recapitulation determines relates to the order of progress in development from motor to mental primacy ; in the early years motor action is most prominent, while in maturity the mental element becomes supreme. At all stages in the life-history of an individual the motor and mental are probably conjoined in a measure, but in the beginning the motor part has a sort of initial and coercive power, which it loses as maturity is approached. The ends of existence in the early years are of a motor character ; the young are interested principally in those things which require motor effort to attain. This fact will be impressed upon any one who follows the development of a child. In the first months there is incessant motor action which is, for the most part, divorced from the will. It is, as Preyer has said, spontaneous ; and it indicates that the avenues of discharge for nervous energy are principally through motor centers. It might not be inappropriate to say that all roads in the brain, especially in its younger days, lead toward the motor regions.

By the end of the first year the will has reduced the bodily members to its authority so that they will obey its mandates, but still the energy of the organism is expended in motor action ; a normal child of this age is never at rest during waking life. His activities

now, though, take on a more purposeful character; they are mainly directed to the accomplishment of tasks which are of interest and value to the child; although he is, of course, fond of plays and games wherein the exercises pure and simple seem to be of supreme worth. A child, it is true, loves to run, jump, roll, climb, balance, and so on, for the mere pleasure such actions give him; but when he builds houses, washes dishes, models in his sand pile, sails ships, cares for his doll, and the like, his motor employments are means to the realization of mental ends. But it is to be noted that in these latter cases mentation has a motor complement; or perhaps it would be better to say it is part motor. A young child does not occupy himself with constructing a purely mental picture of a house; indeed, it is probable that he could not conceive a house in any other way than by actually making it. For myself I have never observed a child under eleven or twelve engaged in genuine reflection, the kind that is fully divorced from motor expression, if there is such a variety. A child's mental action is largely dependent upon motor support for its very existence; if you obstruct motor realization, you prevent ideation in great degree. It is a most suggestive thing in this connection to hear a child, as I have frequently heard one three or four years of age, say to its elders, "What shall I do now?" when at the very moment it was in an environment that, while not affording opportunities for *doing* something, yet inspired vigorous thought on the part of the adults present. But the moment the child can find nothing to *do*, thinking is apt to cease; and the younger he is the more is this true. Cerebral energy prevented from issuing in productive motor channels seems to run riot; ideas become scattered, inchoate, insecure; not coördinated toward definite ends.

Mentation, then, especially in the early years, includes motor elements; and, as Breese says, it is not strictly psychological to speak of sensory and motor processes as though they were independent one of the other. The truth seems to be rather that they are never found apart. We should be unable to have a sensory impression without motor expression; these are simply different phases of a unity. I find myself able to subscribe to this doctrine without much reservation as it relates to the first years of life; but it seems to me, as I have already said, that there is at least a change of emphasis during the developmental process. As the child grows toward maturity it is possible to see greater and greater insulation, so to speak, of the sensory or thought aspect of the mental life; the motor element becomes reduced

to a sort of reverberation which, while always present, is not the prominent, indispensable thing it was at the outset.

We should expect from the foregoing that clearness and definiteness of sensory impressions would depend upon the extent to which they are complemented by motor reaction. In other words, the first part of an idea-total must be hazy and undefined unless the thing appears in its entirety. Baldwin's view, in its essential features, seems to me the correct one—that the perception of a tree, for instance, as we use the term, is dependent upon one's reaction toward the tree. If there was no motor response there would be no consciousness of the object—no thought, in popular terms. While this particular example is necessarily of a speculative character, still I think we have the principle illustrated quite satisfactorily in activities which come within the observation of all of us, and which are amenable to experimentation. Allegra, three and one-half years of age, cannot really perceive, in anything like details, the form of a letter of the alphabet until she has endeavored to trace it. I have followed with minute care her development in the apprehension of form of this nature, and I feel sure that the sensory element in perception gives no more than the vaguest general impression, and that it is only when the eye tracks the making of a letter, for example, and the observer reproduces the movement, that the real perception of form in minutiae arises. So in hearing a word; in pronouncing new combinations to Allegra, she invariably interprets them by old vocal expressions; or, as some psychologists would rather say, she apperceives them by the words with which she is already familiar. But this to me means that in reproducing the word which I pronounce old vocal habits or motor reactions run their course, and the resultant is the same now as on former occasions. To illustrate, Allegra acquired in some way the habit of saying "ephelant" for "elephant." Now it is evident to my mind that she really does not *hear* the correct pronunciation of this word; when I pronounce it she instantly responds with the old motor reaction. I can get her to pronounce it correctly only when I join it to words with practically the same combination of sounds, and toward which she has acquired right vocal reactions.

The principle of motor and sensory unity has been stated as though it were of universal application, but I think it needs certain qualifications. There seems to me to be ideas which contain few if any motor elements in the sense in which these have been spoken of in

preceding paragraphs. As an illustration, take the expression which is frequently heard from children as early as two and a half years: "My doll is lovely." It is possible that the impression of loveliness does in part arise out of the child's reactions toward the doll; but, if so, the motor element soon subsides, so to speak, and there seems to be left simply the memory image of the doll with certain accompanying emotions and somatic reverberations. These, doubtless, do exert dynamogenic influence of a certain kind, determining the child's conduct toward the doll; but this is a different matter. This is the effect of mentation, not its cause or determining condition, although it, without doubt, has a reflex influence in deepening the ideational element. But yet the principle holds for practically the whole of acquired actions that the sensory aspect has become definite through its being supplemented by motor elements.

There is another principle of vital consequence respecting the relations of sensory and motor in the mental life. Motor coördination and sensory coödination seem to be mutually dependent processes. If one follows the course of a child in his mental development it can be seen that in the first years when fine, intricate motor correlations are relatively impossible, so sensory adjustment, if the phrase will be allowed, is exceedingly imperfect. Ideas are not subordinated one to another: they are not connected, coördinated; they run riot in the child's brain. Thought is determined by fortuitous connections. But on each succeeding birthday in the child's development there is apparent greater and greater capacity for reason, as we say; and correspondent with this power develops the ability to coördinate the muscles more delicately, until in maturity motor coördination is complete and reason or sensory coördination is perfected. Now it seems not unlikely that mental coördination is dependent upon motor coördination. This view is substantiated by the phenomena of arrested development in either the intellectual or moral life; there always accompanies this sensory arrest cessation in motor development. An idiot cannot coördinate his muscles as delicately as a normal child; he cannot achieve intricate feats of any sort. So, too, in the opinion of Wey, the Elmira anthropologist, the moral imbecile is defective in motor control; young criminals cannot easily perform tasks, such as climbing a ladder, that demand reasonably accurate motor adjustments, and which the normal individual executes without special effort. Now, considering the order of development, wherein the motor functions are

elaborated earliest, the sensory areas of the brain receiving their developmental impulse in the later stages of the process of maturing, it seems probable that mental arrest is due to lack of motor ripening. It is recognized though, of course, that a halt in the ripening process may occur after the motor functions are quite well developed, so that we may have sensory imbecility where there is quite a high degree of motor skill; but so far as I have observed or been able to ascertain, this condition of affairs is not a common one.

The dependence of sensory upon motor development seems to be especially true in respect of the coördination of hands and fingers. I think it has been shown with a measure of certainty that children who can accomplish the most delicate tasks with the fingers are superior in their intellectual operations; and, conversely, those who have little power of exact and extensive coördination are defective in their sensory processes. For several years I have observed the development of two children in whom this principle has been clearly illustrated. These facts have led Hall and others to say that the centers controlling the peripheral motor activities are the centers employed in the highest types of thinking. Now, this statement, taken literally, appears to me not to be endorsed by neurological fact; the evidence seems to show that thought and motor centers are localized in different areas of the brain. The apparent dependency of highly organized thought upon the proper functioning of the peripheral motor centers can, I think, be explained in this way: in the evolution of the brain in phylogenesis differentiation in sensory and motor functions go on *pari passu*. The most fundamental sensory processes are coupled with the most fundamental motor processes; and the most complex sensory activities, those involved in elaborate reasoning, become connected with the most highly coördinated motor functions. It happens, then, that in ontogenesis the development of one of these functions suffers when the development of the other is prevented or retarded.

One final principle needs to be spoken of before we turn to practical applications. This has reference to what might be called the energedic relationships of thought and motor action. It is a familiar doctrine now, especially since Flechsig's last book appeared, that the most highly differentiated sensory centers, those found in the frontal lobes of the brain, serve to control and inhibit the functions of motor centers; and they accomplish this, at least in part, by drawing into themselves the energy which would otherwise run off by way of accustomed motor routes. Through association fibers the motor reservoirs

are tapped, as it were, and their energy is expended in more distinctly mental undertakings. If this be a correct view, then the inference is safe that the motor centers may be used as sort of laboratories for the generation of energy to be employed in thought, which requires the constant energizing and checking of sensory processes. We should expect from this that, in a brain in which the metabolic processes were vigorous in the motor areas, there would be greater energy for thinking, and I believe experience will endorse this as a general principle. I know two children where it seems this principle is daily evidenced. One has always been active in a motor way, while the other has been deficient in this respect, being little inclined to motor activity of any sort, in play or in the use of the hands in constructive activities. The first child is able to endure far more mental strain than the second; and while this may be due to characteristic differences in organization of the entire nervous system, which it probably is, still I cannot but believe that one important factor in the case is the matter of motor action. Indeed, this is being demonstrated, in a way, for a special process of training is now being practiced to encourage motor activity in the second child, and there is a general brightening up of the psychic life, with marked improvement in mental endurance, so to speak.

II.

The purpose of the preceding discussion has been to emphasize the importance of the motor element in the development of the mental life; and if manual training seeks to secure due recognition for the motor side of education, there is scarcely need for further argument to attest its importance. I understand though, of course, that the term is a technical one and relates to a certain rather limited phase of the motor life of the individual; it does not cover his spontaneous activities out of school or his plays and games in school. Some understand that its scope is confined simply to drawing and to working in wood and iron. This is doubtless the sort of training which must receive attention in formal education: but to my mind it should be distinctly recognized that this is not all, or perhaps even the principal part of motor education. I fear some injury may be done to the best interests of an educational system if it be thought that the work in the draughting-room and in the shop, important as this is, affords all the opportunities needed for motor culture; which, by the way, is not maintained by any of the advocates of manual training, so far as I know. But, if I

may ask here, ought not manual training in the school be extended to include all motor activities that relate to the realization in action of sensory impressions, of ideas, however gained? Modeling Robinson Crusoe, for instance, should, to my mind, be thought of as manual training, since it is a process of realizing both the sensory and motor elements of ideas.

Manual training in the sense, then, in which I shall use the term, is seen to be of supreme importance in all phases of education, but especially in the early years, when there can be little definite mentation without motor expression. It would be better to state the matter in this way, though, I think, that there is little thought in childhood except for the purpose of directing motor activities; the *motif* of thinking must be the accomplishment of motor tasks, not wholly, but largely. I cannot go so far as some who see absolutely nothing in the child mind but that which is coupled with his motor actions; but yet the general principle obtains that the mental faculties take their rise by reason of the necessity of guiding motor reactions, and especially in directing the hands. Perception and memory and judgment grow keen and accurate in the measure that they are required to accomplish ends which call motor activities into play. So, in our educational work in the first years manual training should be prominent. The child must have work to do, tasks to perform that employ the hands; and then the ideas essential to accomplish the purpose in view will become definite, they will become organized, they will be made permanent. I feel the underlying principle of the Dewey School is an eminently sound one, and it is only a question of time when our whole educational régime will be based upon this basal conception.

There is one beneficial effect of manual training which does not seem to me to receive sufficient emphasis in current discussion; and this relates to the work of correlating the thought of the child with the actualities of his environment. Everybody knows, who has lived with children, that in the early years ideas are fancy free; they are not rigidly determined by the realities existing around the child. He creates a world for himself; he is given rather to reverie than to serious thought, as we ordinarily conceive this. But the teleology of the educational process is clearly the promotion of this correspondence between the inner and the outer world, the making of the mind a mirror of reality, bringing it down to the actual world of fact. Now it seems to me there is no material of formal education which can

accomplish this so well as manual training, wherein the child is brought up constantly against natural laws, which cannot be modified by mere fanciful thinking. A child who constructs a box must have first made his thinking processes conform to the operations of natural law; and if he can repeat this in principle in a variety of ways he has done much indeed toward begetting the habit of making thought a true reflection of the outer world of law and fact of its own order. To my mind this work is more efficient than mathematics for the accomplishment of this particular purpose, since, after all, there is a certain amount of fancy, of unreality, about mathematics. One can think the truths of geometry and still not get into the way of making his thought a reflection of the processes of natural law, because he is not compelled to actualize his thinking by applying it to concrete things. The only really effective thinking of the type we are considering is that which is concerned in making things really work; and it seems to me manual training possesses superior virtues in giving the mind that definiteness, that power of detecting true relationships in the world about us, which, it is needless to say, is the most essential quality for harmonious adaptation to environment.

I think it should be pointed out here, though, that manual training, in order to accomplish its specific purpose, must follow the lead of the child's interests. I have seen work in manual training which seemed to me to realize the objects of motor education no more fully than did arithmetic or grammar; it was concerned wholly with the theory of tools and constructions. But this sort of theory is no more motor in its character than is geographical or linguistic theory. The elaboration of a *science* of manual training is very apt to beget some such formality in teaching as characterized instruction in arithmetic or grammar in an earlier day, wherein the beginning was made with definitions and logically elementary principles that were on the whole formal and meaningless to the child. As I see it the motor interests and inclinations of the young lie in the direction of reproducing by the use of suitable materials, the activities which are occurring in their environment. The child is ever seeking to adapt himself to his environment through imitation, and he strives then to copy the work of the carpenter and the blacksmith and the farmer, and others with whom he comes in contact. He has here mental ends given him by his predominant mimetic tendencies, to be realized through motor activities; and manual training ought to start at this point: it ought not to begin with minutiæ and formalities which have not become

mental ends to the pupil. It ought not, in my opinion, to start with the theory of the use of tools ; but theory, here as elsewhere, is to be gained largely through actual experimentation in motor experience. I cannot see that the sensory element involved in manipulating a saw can be apprehended any better when taken by itself than the sensory element in learning a word through sight without tracing it, or through hearing without vocalizing it. But making the start from the standpoint of the pupil's interests, which are always concerned with the reproductions of wholes, and proceeding gradually in a more analytic way, we shall comply with the principle of making the motor action of the child a consummation of ideational potentialities.

Finally, certain limitations of the serviceableness of manual training ought to be pointed out, since there is a tendency in our day, it seems to me, toward overemphasis in this work, which cannot serve the best interests in the long run of this movement itself. To begin with, I cannot see the reasonableness of Scripture's view, that training the will in a motor direction results in the development of a general will power, which may be exercised without loss of vigor in any and in every direction. This can be true only in the sense that the exercise of volition in any way doubtless does accomplish something toward the establishment of a general habit ; and it is of value also in that it augments the stock of cerebral energy which may be drawn upon for the purposes of will action in any situation whatsoever, physical or ideal. But this does not argue that manual training is of peculiar value in the cultivation of volitional power ; the energizing of the will upon any material is able to attain these general results. Conscious effort in a particular direction, however, cultivates the will especially in that direction, and not in all directions. It seems to me one's experience and all we know of neurology contradicts Scripture's proposition, as I understand it. Experience has not shown that a carpenter or a blacksmith has greater power of discharging the duties of a statesman than one who has in the past exercised his will in this special field ; indeed, manual laborers are not distinguished for their will-power in any department of human activity but their own. We would expect, from the known methods of neural action, that exercise of any special description would furrow out channels for the discharge of energy in this direction alone. Will would become strong then in reference to activities of this particular character ; but in expressing itself in any other way it would have to open up new routes, and until these were established it would be at a

disadvantage. So we are not to believe that manual culture offers any better facilities for the general training of the will than does any other subject which requires an equal degree of application; remembering, though, that in the early years the organism most naturally expresses itself through motor action, while in the later stages of the developmental process the will is ready to function in the coördinating of ideas that do not find immediate realization in motor activities, and this is as legitimate and as necessary a function of volition as in directing the hands.

And this leads me to the last word — that with the progress of the child through the schools, manual training should occupy a less and less important place, except for those pupils whose wills in maturity are to be manifested primarily in energizing and coördinating muscular action. A boy who is to be a carpenter should continue in all stages of his educational course to make manual training of this special sort his most important occupation; his organism should keep adjusted to this way of action. But a boy who is to deal with questions of jurisprudence or medicine or education will suffer arrest in his evolution if he is kept too long at work with his hands. His will must come to habitually express itself with ease and efficiency in a different way from that of the carpenter; but if during the entire developmental process his energies be set toward motor action, and not toward ideational correlation, toward thinking of a sort not expressible in manual activities, it is certain that the organism in maturity will react easiest along the lines of hand rather than of head work. This does not mean, however, that manual training should ever be fully abandoned; it means simply that in the higher phases of education it is to receive less and less emphasis, except for those whose life work involves continual use of head and hand, instead of head alone. But the danger of over-emphasis of this subject is not likely to confront us in any other form than in theory, at least for the present; since no practical educator, though believing strongly in its efficacy in the educative process, would give it an unduly prominent place in the curriculum of the high school or college for those who are to follow mental pursuits.

VALUE OF MANUAL TRAINING AS A PRELIMINARY TO TRADE INSTRUCTION TO THE NEGRO.

FRANK K. ROGERS,
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THE importance of labor to the negro is recognized by those of the white race who are interested in his problem, and among the colored people themselves there are many who are beginning to see the matter in the same light, as may be observed by the following resolution adopted at a negro conference held at Hampton Institute in the summer of 1898:

> The question of labor and trade is one of great importance, for upon it depends the physical and material welfare of the race, which in turn must lie at the basis of all social, intellectual, and moral development.

For the term "labor" in the resolution skill in the handicrafts should be substituted, and the word "handicraft" should be broad enough to cover all hand-work which has to do with the home, the farm, or the workshop.

Labor, unskilled, has been a part of the negro's life for the past two hundred years; and in slavery and out he has not progressed, nor can he expect to progress, by such labor alone. When he has learned to combine deftness of hand with a well-ordered mind, he may then expect the same results that have blessed the Anglo-Saxon race. To bring about this important condition has been the problem ever since the war.

Again referring to the resolutions above mentioned, one may see what the negro urges in his own behalf:

> We urge that the manual-training feature, as well as the instruction in business forms and methods, be engrafted upon the curricula of all our primary and secondary schools. We also recommend the establishment of industrial high schools leading to a complete equipment in the various trades and crafts, wherever the community is able to support them, as a part of the public system of instruction.
>
> It is important that our youth be impressed with the necessity of thorough preparation in order to compete with the industrial life of the world. Nothing but the highest efficiency and fidelity to duty can win in the fierce material rivalry. Men demand the best service available for their needs, and it is necessary that schools turn out the workman that maketh not ashamed.

It is as true of negroes as of the white people that not all are able to become skilled artisans. That there are many, however, who are not only well adapted to, but whose inclinations lead them into, the handicrafts will be admitted by all who carefully investigate the matter. It is surely pessimistic to regard negroes as unfit for the trades. Because we have seen them mostly as servants it does not follow that they are fit for nothing else. As a matter of fact, many believe they make poorer servants than other races. I quite agree with my friend who says: "It is a pity to spoil a good servant by making him a poor mechanic." We have no business diverting genius, but this holds as true — perhaps more true — among the whites than the blacks whose development is in a more plastic stage.

The writer believes in the possibilities of the colored race, and that it has the necessary material for development, not only in the direction of the professions, but largely along the line of skilled labor. Because we have been used to looking on the black man's color as a brand of serfdom it does not necessarily follow that he must always be a serf, or that his color cannot also represent high moral, intellectual, and physical ability. It would not be at all surprising if in another hundred years the black race had worked out enough of its destiny to show for what the two hundred years of slavery have been fitting it. Then it may be found that the finest skilled labor of the country is among the negroes.

As to the receptiveness of the colored child with reference to acquiring mechanical skill there is little doubt among those who have been able to make close observations. It has been my privilege to investigate this matter in the Whittier Graded School connected with Hampton Institute, and out of three hundred children instructed in manual training I find almost none who could be marked poor, many who are good, and a few excellent. As a rule, white children run more to extremes; that is, there are more in the very good and very poor classes, and fewer in the moderately good class. Heredity does not as yet count for much in making experts among the negroes, but there is no reason why, after a few generations of mechanics, they should not reach a greater degree of skill through the influence of this important function.

If it is necessary to the best development of the race that skill in the handicrafts should be cultivated, the question then arises: How is this to be done? The old system of apprenticeship is becoming more or less extinct for the white, and, with the natural prejudice against the

black, there are very few places where he can get in at all, even as a helper. It would seem that if it is necessary to provide trade schools for the white people, then, under the circumstances, it must be more necessary to provide them for the negroes; and much has already been done in establishing such trade schools for the boys, and schools of domestic arts for the girls.

In order to accomplish most for the negro in teaching him a trade, it is self-evident that the best common-school foundation is none too good, and it would be better if with this could be incorporated a thorough and complete round of manual training from the kindergarten to the high school. This manual training should have special refer ence to the negro's problem. If utilitarianism is ever permissible in manual training, then in the negro's manual training it should be carried to the extreme limit of its value.

The importance of manual training in the negro's education can hardly be overestimated, for, besides the useful end it serves in the acquiring of skill at tools and a knowledge of things leading up to the selection of a trade, it furnishes a mental stimulus, the high moral and intellectual value of which is one of the negro's greatest needs. The colored race must have men and women who can think for themselves and for others about them, and who can execute as well. Such men and women may be called race leaders, and one who cannot show the people a better way to live by living a better way himself is a poor leader. Imagine the far-reaching moral effect a good teacher, who has had the advantage of a round of manual training, may have in a colored community, in helping his people to a better mode of life. But it is to the value of manual training as a preliminary to trade instruction to the negro that we should now turn, not forgetting that the mental value is as great to the mechanic as to any other, and that a well-ordered mind, together with skill at a trade, is, after all, what we should produce in any mechanic, white or colored.

Looking at the direct bearing of manual training with reference to the trades, I would call attention to the following statements:

1. It creates a love and respect for skilled work.
2. It proves the ability to acquire skill with tools.
3. It aids in the selection of a trade.
4. It provides some knowledge of and skill at other trades which may supplement the trade selected.

Considering the first statement, I would say that I do not believe the negro is as lazy as he is supposed to be. I do not deny that many

are indifferent to work, but, judging them by the standard to be found in southern latitudes, one cannot fairly call them lazy. Thriftless and aimless many certainly are, and much of their work goes for nought. But I have often watched a gang of colored laborers digging trenches, and in my judgment they work more and shirk less than the average gang of mixed laborers in the North. The prevailing idea among the negroes that freedom meant a life of ease was a natural reaction from many years of enforced drudgery, and it is not strange to find many boys and girls coming to school to learn something which will enable them to make an easy livelihood rather than something which trains for labor. But these students become so interested in their manual training that shirking an exercise is an unknown thing, and the earnestness and painstaking care which they soon show is proof that they are interested. If they were as lazy and indifferent as we are often led to suppose, why should we not have a continual struggle to keep them at their work — a condition unknown in my own experience ?

The librarian at Hampton Institute says that the books bearing on trade subjects are the ones most sought by our boys, and that the supply is never equal to the demand. In the reading-room the trades journals and the *Scientific American* are pored over more than all others. This certainly does not look like apathy on the part of the colored boy toward skilled labor.

The round of manual training at Hampton Institute for the three years of the academic course is as follows :

Junior year : joinery.

Middle year, first half : turning.

Middle year, second half : sheet-metal working.

Senior year : { mechanical drawing / brick-laying / forging } optional.

In the senior year the option is made under the guidance of the principal of the academic department and the director of manual training. Some drawing is taught in connection with junior and middle-year manual training in the shop where the work is done.

With regard to the second statement — the ability to acquire skill with tools — it is certainly safe to say that the negro has this ability. His mind may work slower in the process of reasoning, especially along the line of mathematics, but he quite readily learns to sharpen his tools and use them skillfully, and, if he errs, it is not so much because of lack

of skill in handling a tool as it is his rather poor conception of fine measurements.

As to the third statement — that manual training aids in the selection of a trade — I would say that in estimating the value of this useful purpose of manual training we must bear in mind that on account of home environment and heredity the negroes lack what, to the white race, have been important factors in its development and selection of occupations. Contact with household utensils, games, and toys provides certain educative influences for the white child, which, with the thoughtful guidance of his parents, and, in many cases, the influence of the father's occupation, lead him by gradual steps into his proper sphere in life. In most cases the negro child has no toys or games, and the house is as bare of utensils as it can well be. His father and mother have been slaves, whose ancestors for generations have never had an opportunity to choose a means of livelihood for themselves or their children. This opportunity furnished by manual training is certainly a great boon to the negro boy, as it not only saves him much time when he takes up a trade, but establishes in his mind the congeniality of his choice. The economic value of this factor of manual training to the negro, who is so much slower in development than the white, makes it of the greatest importance to those who expect to become mechanics.

The fourth statement is as follows: "It provides some knowledge of other trades which may supplement the trade selected." For instance, to the carpenter the sheet-metal work in which is some roofing, gutter, and spout work may be a great help; and wood-turning will help the carpenter, cabinet-maker, and wheelwright. To the wheelwright a knowledge of forging may be a great help.

The negro, who in most cases will settle in a country community, finds this extra knowledge of greatest value. The writer knows a colored carpenter who is most seriously handicapped in housebuilding because he cannot do his own gutter work and tin-roofing. In his community no one but a white man can do such work, and the white man always puts off the work of the colored contractor until the last, and then charges his own price. This kind of thing has been brought to our attention so often that special effort is made to convince pupils of the necessity of as much supplemental knowledge as possible.

Hampton Institute, which, from its foundation in 1868, has been decidedly an industrial school, has passed through many phases of

manual training and trade instruction. At present manual training in some form is given to every pupil of the day school, from the kindergarten through the academic department, whether he intends to become a trade student or not. Both boys and girls are included in the list, though in the upper grades of the grammar school and in all the academic grades the girls' work is mainly sewing and other domestic arts. The trade school at Hampton draws from the graded school and academic departments for some of its pupils, and we hope, as time goes on, that more of the candidates for trade instruction may see the necessity for a full academic course with its round of manual training. The reason for this is twofold: first, the good school foundation before entering a trade is one of the most vital factors in its mastery; and, second, as will have been seen from what has preceded, the manual training, with its supplemental knowledge and fine mental stimulus, helps to make a stalwart and gifted mechanic — one broadened and rounded as no apprenticeship alone can produce. So important is this matter in the minds of the principal and trustees of Hampton Institute that they gladly coöperate with negro schools which may be willing to introduce manual training into their curricula, hoping thereby to draw from such schools candidates for the higher industrial classes of the trade school at Hampton. It is interesting to note that already there is a movement suggested to carry out this plan, and this, too, originating at one of the schools above referred to. With the permission of President S. G. Atkins of the Slater Industrial School at Winston-Salem, S. C., I quote at some length, since the expressions to which he gives utterance seem to establish the fact that, in the minds of some of the colored leaders, at least, the premise stated in the title of this paper is a true one. The quotation is taken from an address delivered by President Atkins at the Negro Conference of 1898, before mentioned in this paper, and is as follows:

1. I propose a federation of the industrial schools, in such a way that our work may point to a common and definite end, and that there may be for our young men and women a promise of accomplishing something in the end that can be made available.

As I see it, this will give the schools a great advantage, in that antagonism and undue competition will be removed from among them; and it may be determined what enterprises really have some promise of success and what ones have none. Of course, the frauds will not enter into this federation, and it may be that some of the deserving schools will stand aloof; but every praiseworthy school will desire at least to fraternize and to correspond in reference to such suggestions as contemplate the good of all. This federation will be a means of showing to our friends of the North and elsewhere just what is being done along this line, and of giving to them tangible

evidence of the effect of their contributions for this purpose. Through it we can secure for all the schools a single graded course of training, and thus systematize the whole work in such a way that industrial training in every school will be leading up to a certain, definite end.

2. I propose, in the second place, in order to make this federation effective, and this coördination of courses practical and easy, that Hampton and Tuskegee be the finishing schools of this federation, and that the faculties of their trade, agricultural, and domestic-science schools prescribe the course, including the first year and up, so that all the schools may be able to pursue a consecutive course of training, leading up to the highest technical and industrial proficiency, as afforded during the last years of the students' course in the completely equipped industrial schools at Hampton and Tuskegee.

Tuskegee and Hampton have their splendid trade schools, magnificently equipped, and the plan here suggested, besides helping all the industrial schools to systematize their courses, will, in a sense, give the entire race the benefit of the great industrial plants at Hampton and Tuskegee; for by this arrangement we shall have, especially in the course of study, the benefit of the actual work of their experts in all departments in which this consecutive and complete course of study is pursued.

Thus it may be seen that manual training is accepted by leading negroes as an important factor in the education of the children of their race, and, moreover, they are planning for a more advanced course in industrial education, for which the manual training shall be a stepping-stone. It must not be supposed, however, that many of the colored children of the South actually receive the benefits of manual training. There are but few elementary schools into which it has been, or for a long time can be, incorporated. The struggle for existence of many schools in the South makes it impossible to have any luxuries; in fact, very few of the actual necessities can be provided.

In speaking of skilled labor, in this paper, farming is included, and there is no trade, unless it is housebuilding, which is of so great use to the colored man. The white man is beginning to realize that talent is needed to make a successful farmer, and that learning the trade is as essential in farming as in plumbing. There is no sphere in life in which the mental and useful ends of manual training are of more value than in that of the farmer and his wife. There is no doubt that the place for by far the great majority of negroes is on the farm, but the tendency is for them to get away from it. Farm drudgery to the negro savors of slavery. It was the kind of work he was compelled to do, and it is not strange to see him break away from it when the opportunity comes. One of the tasks which Hampton and Tuskegee have set for themselves is to teach the negro in such a way that he will see the need of good tilling of the soil, and will love farm life enough to make it his means of livelihood. That this task

has many difficulties is very true, but that it is far from hopeless is also true. It is not within the province of this article to enter into the details of training agriculturists, but as farming may be a kind of skilled labor, and as manual training is an important element in the preliminary training which leads to such skilled labor, it may not be out of place to speak of a few points in passing.

The utilitarian ends of manual training in correlation with farm work may, with equity, be carried more to excess, especially along the line of making the exercises represent some actual things used on the farm. At Hampton such exercises as farm-gates, fences, chicken-coops, wheelbarrows, and the construction of barns are used in carpentry; in blacksmithing, setting a tire, making harrow teeth, chains, bolts, staples, etc. A fine opportunity is provided in this work for coöperation with the head of the agricultural department, by working on such exercises as he has examined and approved.

As a part of the effort to teach a love for and interest in agriculture, nature study is made a part of all primary and academic work, and here again is a fine chance for correlation, in the making of insect stretchers, cages, cabinets for specimens, etc., by the more elementary classes.

In conclusion, it might be well to state that the demand for young colored men and women who can teach some form of manual training or domestic science, in addition to academic studies, shows that the importance of such work is accepted. The supply of such teachers cannot meet the demand. Friends in the South and North give liberally, when industrial education is to be provided, and from white and colored come many words of encouragement and sympathy. Surely the harvest is ripe, but the laborers are few. It is to the colored people themselves that we must look for the laborers, and they are coming in slowly, but surely. A new era is dawning, and, thanks to the white people of the South, whose struggle has been a hard one, and to the noble philanthropists of the North, general school accommodations are gradually improving, and in many centers manual-training and trade schools are being established. The fathers and mothers are beginning to see the importance of schooling and skilled labor, not only in the so-called trades, but on the farm and in the home.

DRAWING IN MANUAL TRAINING SCHOOLS.

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DRAWING must be regarded as an universal method of expressing thought. The picture writing of the savage or half-civilized tribesman is a long way removed from the complex drawing of the master draftsman, or the masterpiece of the great artist, but it serves to show the marvelous progress made by the art of drawing. No refinement of sentiment, emotion, or intellectual effort is too subtile to elude the skillful master's pencil or brush, and should the art of drawing be suddenly lost, the industrial work of the world would be paralyzed. Every trade, profession, and industry of modern life pays willing tribute to this art.

A drawing is independent of the draughtsman's nationality for interpretation; his spoken language may be unintelligible to the listener, but if he be skillful with his pencil he may through it convey any desired imformation.

Being of such a fundamental and universal character, it seems strange that drawing should not earlier have received more respectful and thoughtful attention at the hands of the public schools. Even now in certain benighted localities it is regarded merely as an accomplishment, the teaching of which in the public schools is of questionable propriety. And do we not yet often hear such complaints as these? "I can't learn to draw, I have no *talent* for drawing" and "Mamma says I might as well drop drawing because I never could learn to draw." The repetition of such complaints only goes to show that both pupil and parent have a mistaken notion of the purpose of the drawing course and of its general culture value. If its purpose was to produce artists, then such complaints would be well grounded. When the educational value of drawing becomes better understood we shall have few requests to excuse pupils from taking it.

"Having eyes, they see not," applies with propriety to young people who are as yet untrained in drawing, so greatly is the power of perception increased by this training. Note also the effect upon such mental qualities as memory, imagination, comparison, judgment, etc.

Drawing without thought behind it is like speech without thought — aimless, empty, meaningless. To secure good, clear thinking is recognized as one of the highest aims of education. Therefore drawing properly taught is a powerful aid to successful school work. It becomes an educational process of an exceedingly profitable nature when presented by the skillful, well-trained teacher — no other should be entrusted with its presentation. Just so soon as we succeed in getting pupils to put thought into their drawing work, our teaching is on the high road to success.

In the modern school, drawing has come to be recognized as an indispensable factor. The manual-training school, as would naturally be expected, makes drawing of very great importance. In some of these schools the mistake has been made of confining the instruction to mechanical work alone, thus ignoring the artistic and esthetic element which freehand work can be made to confer. A somewhat similar tendency is observable in some technical schools to ignore the so-called "culture" studies under the plea of lack of time. It is a grave mistake. It is robbing their graduates of a part of their birthright, a share in the accumulated culture and refinement of human thought, the work of countless generations of master minds. To ignore this element in education is to magnify the materialistic tendency of the age, which needs no such stimulus but rather stands in need of repression.

The greatest menace to our progress in national greatness is materialism; a disposition to measure everything by the standard of immediate money value. One serious defect in our industrial products has been their lack of art-quality when compared with those of other nations which have in many instances surpassed us for this reason alone. Characteristic American shrewdness has however detected, and in a large measure already remedied, this defect. The large number of enthusiastic and earnest students in our art schools and the creditable work they are doing are an encouraging sign of the times.

The manual-training school should give a broad and liberal elementary education, touching life in as many points as possible, subject to such limitations as time and expediency impose. The drawing course, besides paying attention to the matter of hand training, should afford some real art education, striving to cultivate an appreciation and love for the beautiful in form, color, and proportion; a knowledge of the great movements in the development of art, and of man's struggles to

interpret and portray the mystery and poetry of life and of his own higher spiritual nature and aspirations.

A nation's art displays the highest and grandest externalization of its thought, character, and spiritual life. A study of art is therefore a valuable aid to history, revealing as no other record can the true story of man's development and progress.

Materialism comprehendeth but faintly this phase of education and sees in it nothing but sentimentalism and a useless waste of time. "Give us practical school work for our children, something they can use in everyday life" says Mr. and Mrs. Practical. Very good, then you cannot afford to omit from the list of practical things such elements as drawing and modeling and art education in general. Life does not consist merely of eating and drinking and sleeping! Wealth does nor insure success in life, and poverty does not necessarily preclude it. The capacity to enjoy life is a true test of education, and art education is no unimportant element in developing this capacity. While it is not the purpose of the drawing course in the public school to produce artists, any more than any other class of workers, it is its purpose to produce men and women who are able to appreciate the work of artists.

The course in mechanical drawing cannot be based upon the course of shop exercises. This is found to be quite impractical for several good reasons. Chief among these is the fact that the natural order and sequence of shop exercises does not harmonize with either the method of instruction in drawing or the range and variety of work it should embrace.

In the Denver Manual Training High School we have adopted the plan of having the student keep a sketch note-book in the shop. Under the direction of the instructor the student makes freehand sketches of such shop exercises as the instructor selects for this work, noting carefully in figures all dimensions. The drawings are made quickly but with some attention to style and neatness, and are examined from time to time by the instructor to ascertain if the proposed construction is fully understood. At other times the pupil works from blue prints put into his hands without his having made the drawing. Thus he learns to work from a drawing made by himself and also to read and work from a drawing made by some other person. Sometimes, and indeed often in the freshman year, the shop exercise is made the subject of the more careful and finished drawing in the draughting room. In the senior year the students almost always work from blue prints made from the instructor's tracings. It goes without saying that the

students must readily read and work from these drawings; their mechanical draughting, however, is by this time of a much more difficult character than the majority of these blue prints.

We give the same time to freehand drawing that we do to mechanical, two hours per week throughout each year of the course, and include in this work clay modeling and designing and study of historic ornament.

The intimate relation of drawing to the other work of the school should be recognized and cutivated in every practical manner. It can be used to advantage in so many ways that it is scarcely necessary to mention them. A drawing may often elucidate a knotty point in a recitation in a manner that no amount of wordy description could rival. Pupils should be encouraged to attempt original work of this nature; it puts their drawing to practical application.

In the geometry class when figures and diagrams are to be put on the blackboard, the pupils should be required to put into practice what they have already learned in the draughting room, and in all classes, whenever any kind of drawing or lettering is required, the teacher should reinforce the work of the drawing teacher, by insisting upon good, workmanlike results.

In conclusion we would call attention to the fact that hearty coöperation between members of the faculty of a school is the secret of the school's success. It is like team work in athletic contests. No amount of brilliant "star" playing on the parts of individuals can atone for the lack of team work — harmonious coöperative work. The province of one teacher often necessarily overlaps that of another; let each recognize the fact and improve the opportunity to add to the efficiency and interest of the other's work. Thus the mathematics recitation may often become a drill in the use of exact, concise, and elegant language. A language recitation may for the time become an exposition of some phase of history or science, and so on.

No one teacher "liveth to himself alone;" the boundary of the nominal work of any one teacher should not rise up like an unsurmountable barrier whenever the subject-matter of the day's recitation shows a tendency to stray into the field of some other teacher's department. Such opportunities should be welcomed and improved in a spirit of mutual helpfulness, as a chance to promote the welfare of the common cause — the harmonious and well rounded development of the pupil, without stopping to consider whether or not the result will redound to individual credit or recognition.

It is well to note that the artistic culture to which we referred as being one of the objects of the drawing course is not altogether confined to the drawing course or to formal instruction or lectures. Much that is of the highest value comes from environment and association, and is absorbed unconsciously from surrounding conditions. For this reason the school furniture, fittings, and decorations play an important part. Thanks to modern processes, good examples of art can be obtained at a very moderate cost, and so it is by no means uncommon to find genuinely artistic school interiors. The effect of daily association with such surroundings is to refine the taste and cutivate a just appreciation of art.

CONSTRUCTIVE DESIGN IN WOODWORK.

William F. Vroom,
New York City.

It is required by the principles of good design that the article designed shall be adapted to the use for which it is intended; that it shall be well proportioned from an artistic point of view; and that it shall be structurally correct with reference to the material employed. The first is a matter chiefly of common sense, and the second of artistic feeling; while the third, with which this inquiry has to do, demands in the designer a practical knowledge of the materials used and the correct proportion and arrangement of parts to form a strong and durable fabric.

Practical fitness and structural correctness are necessary elements of artistic design, but neither practical fitness nor artistic form is essential to sound construction. In other words, *that which is structurally good may be artistically bad, but that which is structurally bad cannot be artistically good.* Hence we see the value of the study of constructive design for the artist as well as the artisan.

Since wood is the material with which we have to deal, let us consider some of its peculiar qualities. Chief among these is its fibrous structure. From this results its liability to split, that is, to part in a plane parallel with the grain rather than crosswise. From this also results the tendency to contract and expand across the grain, while the shrinkage endwise is so slight that it may be left entirely out of account. Warping and twisting are only other phases of the phenomenon of shrinkage due to the structural characteristics of the wood. As it does not lie within the province of this article to explain these peculiarities, we must be content to accept them as facts which must be taken into account in designing.

From these characteristics of timber certain rules of construction may be deduced, but their usefulness will consist rather in helping to make the subject clear than in doing duty as a guide in any concrete case. The most carefully devised rules must be very general in character and attended by numerous exceptions, and rules at best can never do the work of common sense and a clear conception of the facts underlying them. It should be observed here that the principles of

wood construction are materially modified by the size of the thing made. The problem of the distribution of forces, for instance, which, in the construction of large buildings, bridges, etc., is a matter for profound calculation, becomes, when applied to portable things, merely a matter of judgment. The principles formulated below will therefore be understood to apply chiefly to the designing of articles of comparatively small dimensions.

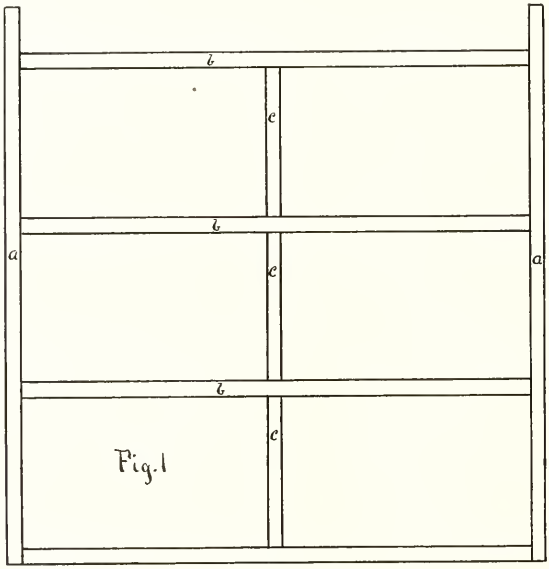


Fig. 1

1. Parts should be so arranged that all strains of compression or tension shall be in the direction of the grain of the wood, and all bending strains crosswise. In general there is little danger of this rule being disregarded, since we do not buy boards or timber in any form with the grain running crosswise, but examples of its infringement are not wanting. A common instance may be seen in the framing of houses, where the floor-beams, *b* (Fig. 1), are supported by the walls, *a*, at the ends, and at intervening points by studs, *c*, which rest on the beams below. Here the strain of compression in the center of the building comes parallel with the grain in the studs, but across the grain in the beams, the shrinkage and compression of the latter causing the floors to sag. This accounts for the racking of door-frames and the sticking of doors. Again, in the construction of a plain box

the amateur will frequently place the ends, and perhaps the sides also, with the grain as at *A* (Fig. 2), instead of horizontally as at *B*. The exposed edge of *A* (in degree varying with the size of the box and the thickness of the stock) is subject to bending strains from within or without, and the grain of the wood should therefore be parallel to that edge.

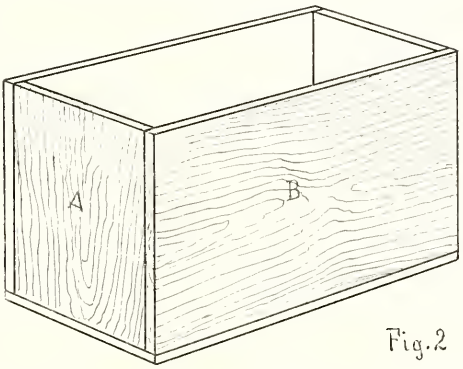


Fig. 2

2. Wherever practicable let all parts be secured at the ends and free at the edges.[1] The observance of this rule would prevent many mistakes in construction. In paneled wainscoting every stile and every panel should be free at the edges to allow for shrinking and swelling. In a drawer the back, front, and sides are joined firmly at the ends, but the edges are free, the

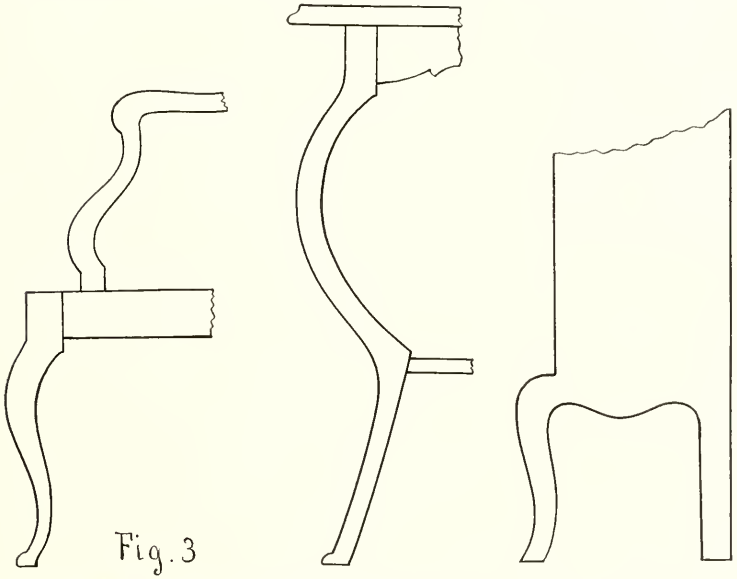


Fig. 3

[1] The terms "ends" and "edges" are used here with reference to the direction of grain, and not to the shape or position of the piece.

bottom sliding in a groove. In a table the rails are solidly joined at the ends, but their edges should not be rigidly fastened to the top.

3. Let all parts be of such form that the grain shall be continuous from end to end. This principle is opposed to the practice of cutting wood into forms unsuited to its nature. A few common examples of this kind of bad design are shown in Fig. 3.

4. All large surfaces should be broken into panels or otherwise arranged to provide for shrinkage or expansion. In conformity with this principle, panels are used in house doors, wainscoting, the ends and doors of cabinets, and many other similar places. The edges of panels, as noted in the second rule, should be left free to move in the groove, the ends being glued at the middle so that the panel will move equally at both edges. Matching, or fitting edges together with tongue and groove, is another method of providing for variation in

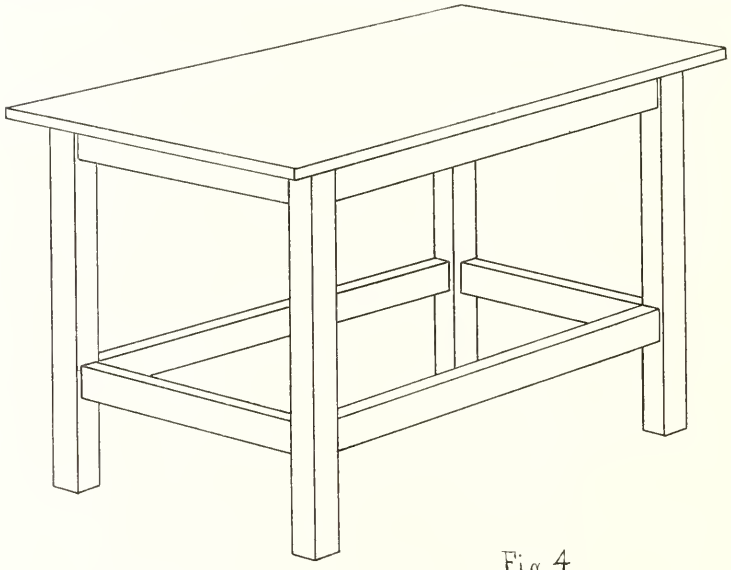


Fig 4.

width. When a wide, unbroken surface is required, as in the tops of tables, desks, counters, etc., the board should not be rigidly fastened to the frame which supports it, but provided with a fastening which will allow it to contract and expand, as shown in Fig. 6.

5. Let some transverse support be provided for any detached board, such as a shelf. Cleats, crossheads, or battens of some kind

should be attached to boards which are not fastened to anything else, but in no case should they be glued rigidly to the board, which they are designed to keep from warping, not from shrinking. Boards attached at one edge, *e. g.*, a shelf or the back board of a bench, should be similarly secured, the bracket usually being sufficient in the case of the shelf.

6. Insert members running the full length, breadth, and height respectively of the article to be constructed. This rule applies principally to "case-work"—bookcases, chests of drawers, desks, and the like. Such conditions as would render its infringement probable are not of common occurrence, and its soundness is obvious, yet it is sometimes disregarded, and a weak construction is the result.

As an example of the application of principles in designing, let us take the construction of a table, beginning with what we may term the

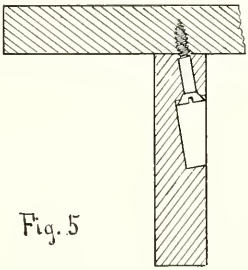


Fig. 5

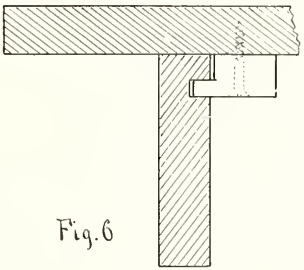


Fig. 6

normal table, as shown in Fig. 4. This we will suppose to be about 3 feet by 5 feet, legs 2 inches or 2½ inches square, rails 3½ inches or 3 inches wide by 1½ inches thick. The joint in general use in joining rails and legs is the mortise-and-tenon. For securing the top to the frame the common method is to screw through the rails into the top, as in Fig. 5, but this is not the most satisfactory plan, since the shrinkage of the top tends to break the hold of the screws or to bend the side rails by pulling them in at the middle. The alternative is to attach blocks to the top at intervals, as shown in Fig. 6, each block being provided with a lip which runs freely in a groove in the rail. The projection of the top over the frame should not be more than 2 inches. The rail should be set in about ¼ inch from the outer faces of the legs.

This construction is given as being suited to the ordinary uses of a table—strong and having the chances of bending, warping, or splitting reduced to a minimum. But it is not therefore clumsy nor inartistic;

on the contrary, this very quality of soundness of construction is the foundation on which the artist must build. Let this table be made of oak or mahogany, well joined and finished and tastefully carved, and it will be worthy of an honorable place in a home of refinement. The turning lathe may be used with good effect on the legs if desired, the parts where the rails enter of course being left square. The use of but one lower rail lengthwise, that being framed into the middle of the end rails, somewhat lightens the effect and makes a sufficiently strong frame.

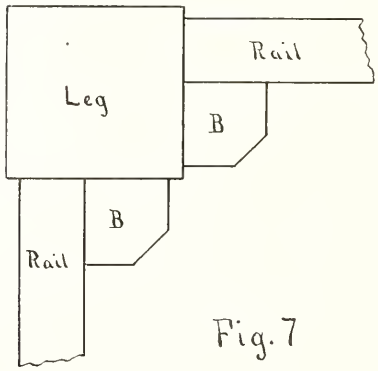


Fig. 7

But the construction of the table will of course be modified by varying conditions, such as size, use for which required, taste of the designer, etc. The lower rails may be dispensed with entirely, but in that case the upper rails should be wider and the legs increased in size in order to retain the necessary strength. While the leg is made larger at the top, it should be made smaller at the foot, for, paradoxical as it may seem, this tends to increase rather than diminish the strength of the frame, or, more accurately speaking, it tends to lessen the chances of fracture. As the weight and rigidity of the leg are reduced by the removal of surplus material at the lower part, the strain on the joint in moving the table becomes less—and it is probably because the tapered leg *is* better that it looks better. So long as the leg is required to retain its size for the purposes of construction, as in Fig. 4, it does not appear clumsy, but the removal of the lower rail quite changes its aspect.

A table frame is rendered more rigid by the insertion of blocks, (*B*, Fig. 7). The block should be nearly as long as the width of the rail, and should be glued firmly in its place. These are especially necessary when the rail is not more than ⅞ inch thick, which is generally the case in ordinary work.

If a larger table is desired the size of the legs should be further increased, or the lower rails inserted, or both. The width of an upper rail is seldom greater than 5 inches. In a very long table it is advisable to insert cross-rails, which serve to stiffen the frame and give additional support to the top.

Smaller and lighter tables should still be constructed on the same principles as our normal table, but modified in detail. The size of legs may be diminished with the size of top, and made to suit the environment. A table for a lady's boudoir, for instance, may be very light without infringing the rules of good design; but it must not be *shaky*. There is no excuse for a shaky piece of furniture of any description under any circumstances. Slender legs may be strengthened by the introduction of brackets or braces bearing under the rail, or by connecting pieces below answering the purpose of the lower rail. These auxiliary members may be so designed as to add beauty as well as strength to the structure. The insertion of a shelf about 9 inches from the floor affords a good method of bracing the legs of a table while at the same time adding to its usefulness and sometimes to its symmetry.

Curved legs after the style of the Louis XV period (Fig. 8), although they have frequently been assailed by art critics, are much in demand today by people of wealth and refinement. From the artist's point of view the style is untruthful even though it may be strong. From the practical designer's standpoint it is capable of being so treated in construction that it will withstand all strains to which it is likely to be subjected. This is proved by the fact that it has survived the test of a century's use. The rail is necessarily made of stout material and may have a larger bearing surface at the joint than that of the ordinary table of rectangular construction, and it is on this joint that the strength of a table mainly depends. As for the leg, though of necessity cross-grained, it need not be sufficiently curved nor sufficiently slender to render it too weak to serve its purpose. What fault, then, can the practical man find with it?

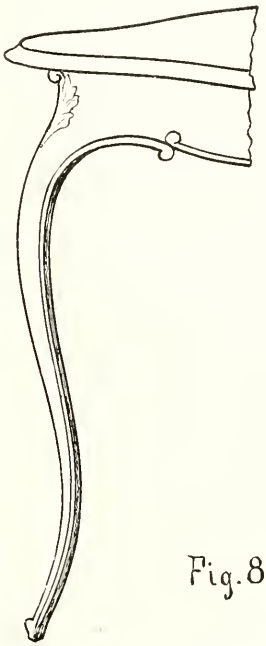


Fig. 8

We are dealing with constructive design as distinct from artistic design, it is true; but what do we mean by constructive design? Not merely designing to obtain the minimum of strength necessary to

carry an article through a respectable term of existence. If this were all, the expert in construction would be forced to take sides against the art critic in defense of the veriest monstrosity which any crude imagination might devise, provided it did not fall to pieces when used. We mean rather designing in conformity with certain principles, and one of the principles which few, I am sure, will be disposed to reject, is that the design must be adapted to the characteristics of the material

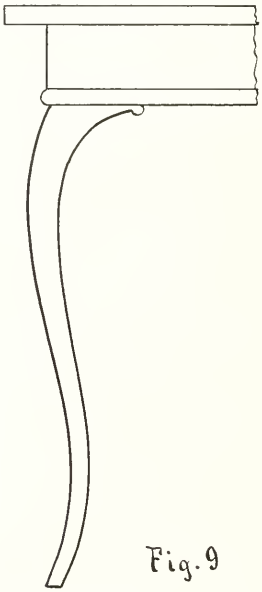


Fig. 9

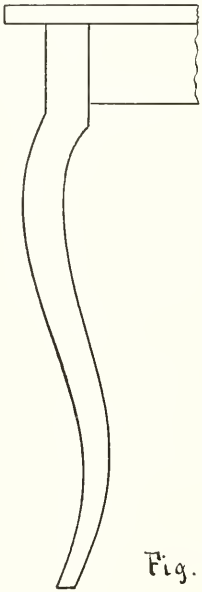


Fig. 10

used. Now wood is a straight-line material; its grain is straight, approximately, and any cutting across the grain seriously weakens it. Any design therefore in which the important members are crooked, (as are both the legs and rails in the Louis XV table), and which tries to conceal a joint because the necessities of wood construction bring it where the designer does not want it, is not well adapted to such a material as wood. The practical designer then, however unskilled in art criticism, should on principle, and would from the fact of his being practical, feel little disposed to favor such forms as that of the table in question.

Let it not be supposed, however, that the writer would banish all curved lines from wood construction. To do so would be not only

undesirable but practically impossible. Where to draw the line between that which is too crooked and that which is not; where to admit a curved member and where to exclude it; how to determine what forms are adapted to wood construction and what are not, must always be left to the judgment of the individual designer; and he who has had practical experience in the workshop, in addition to the esthetic instinct, will have the advantage in forming right decisions.

Great variety of treatment has been employed in designing curved table legs. In many the joint is not obscured by the design, as in Fig. 9 or Fig. 10. In the latter the mode of construction is essentially different from the type we have been considering. The rails are joined to each other at the ends, the legs being usually attached with dowels. Fig. 11 has but a slight curve, and is considered by many a pleasing variation from the turned leg.

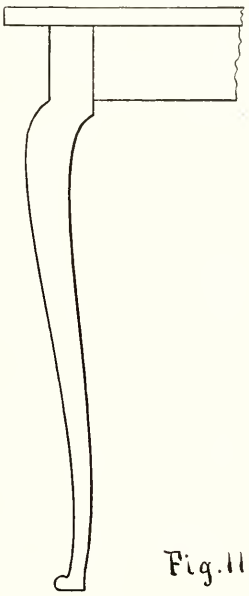


Fig. 11

There are many other varieties of tables involving wholly different methods of construction, but space will not permit their discussion here. My object in selecting one type has been to emphasize the principle that construction is the basis of design, giving a hint of the numberless modifications of which the type is capable in size, form, massiveness or delicacy of proportion, plainness or richness of finish and detail of construction. If the amateur designer has caught the spirit of my argument he will avoid the error of sketching a combination of curves and carvings with some general resemblance to a table, and trusting to the skill of some obliging workman to devise a way of putting it together.

It does not follow, however, that because artistic design is based upon sound construction the designer should therefore begin with a working drawing. His art does not consist in finishing off a ready-made framework. A free-hand sketch should first be made, this to be corrected if necessary until a satisfactory result is obtained. While this sketch will show no details of construction, it will take its character from the designer's knowledge of constructive principles. Working drawings may then be proceeded with, the design, which was first seen

as a whole, being resolved into its parts and methods of construction worked out.

The necessities of construction should be regarded as a help rather than a hindrance in designing, as giving a distinctive character to the article produced in any branch of industrial art, and still affording boundless opportunities for originality and diversity of treatment within the sphere of each. The designer who feels hampered by the limitations of constructive principles has not arisen to the dignity of an artist.

LOGGING IN THE SOUTH.[1]

CLINTON S. VAN DEUSEN,
Bradley Polytechnic Institute, Peoria, Ill.

THE work of getting logs out of a forest is quite a task, even where the land is level and the climate is such that good sleighing is supplied to help in the work; but where these favorable conditions do not exist, as in many of the forests of the South, the task is still greater. A large part of the timber land there, especially that containing cypress, consists of swamps with small sluggish streams forming a network through them, and the use of sleighs or wagons is out of the question. Until quite recently these difficulties have delayed the development of the lumbering industries in the South, but the inventive genius of the American has now quite effectively overcome them, and as a consequence such lumber as cypress is now becoming quite popular. Two systems known as "the skidding system" and "the pull-boat system" are in successful operation, and they seem to meet the difficulties quite effectually.

A LOG COMING IN

The first system consists in dragging the logs out by means of steel cables, arranged so that the front end of the log is held up from the ground and thus prevented from catching on obstructions, such as stumps and cypress knees. A main cable is stretched at some distance above the ground between two trees, or if the engine and winding drums are on a

[1] Illustrations for this article were furnished by the Lidgerwood Manufacturing Company, of New York.

scow, as is often the case, a mast on the scow may take the place of one of the trees. On this cable travels the skidding carriage to which is attached a pulley through which passes the hoist rope, and to the back of the carriage is attached the out-haul rope. The engine operates two winding drums. From one of these the hoist

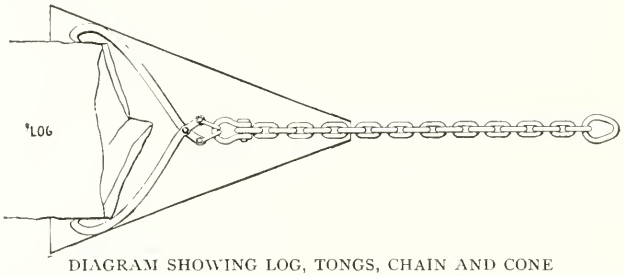
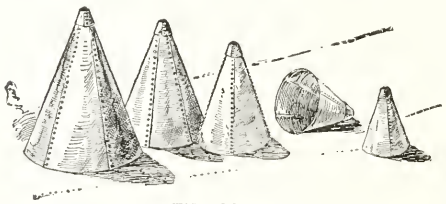


DIAGRAM SHOWING LOG, TONGS, CHAIN AND CONE

rope passes out through the pulley on the carriage, and at the end of it are the tongs which are attached to the logs. From the other winding drum the out-haul rope passes out through the side of the carriage and thence through a pulley at the outer end of the main cable and then back to its fastening at the back of the carriage. When at work the carriage is held in place by the out-haul cable until the front end of the log is raised well above the ground, and then the out-haul rope is paid out as fast as the hoist rope is drawn in, and this keeps the front end of the log clear of obstructions. Usually several pairs of tongs are fastened to the end of the hoist rope, and thus as many logs may be hauled in at one time as there are pairs of tongs attached. The engine is usually located near a stream or railroad, and after a load of logs has been brought in, the carriage and tongs are again drawn out by the out-haul rope.



THE CONES

In the pull-boat system there is also an engine operating two winding drums, which are mounted on a large scow. A cable passes from one of the drums out into the forest, and, after passing through a pulley anchored to the base of a large tree, sometimes a half mile from the scow, passes back to the other winding drum. The ingenious point in this system consisis in attaching the tongs to a log and then

having a hollow steel cone slide back over the tongs and the end of the log. By this method the logs may be drawn along on the ground without catching on obstructions or gathering débris. Shackled to the main cable in two different places are several side or branch cables, each bearing its pair of tongs and cone. By means of this arrangement, while one winding drum is hauling in its load of logs, it is also hauling out the tongs and cones ready for the other drum to draw in its load. The logs travel at the rate of five or six hundred feet a minute.

ASSOCIATIONS

THE NEW ENGLAND ASSOCIATION OF TEACHERS OF METAL WORKING.

THE teacher who deals with a technical subject needs something that the large educational associations cannot supply. These associations deal with general problems in a helpful way. Their meetings mark the progress of events in education and help to preserve the idea of unity by bringing together the workers in its various departments. No teacher, no specialist, certainly, should miss the inspiration and the balancing influence which a well-planned meeting of such an association affords. But the details which require of the individual teacher most careful and exhaustive study, a large society, for obvious reasons, cannot reach. He needs, therefore, frequent opportunities to compare notes with those with whom he stands on common ground, and to examine his theories in the light of their observations and friendly criticism. Especially is this true of teachers of manual training who are obliged, usually, to arrange their own courses out of material which is comparatively raw.

There have been organized in New England, within the last four or five years several associations, each composed of teachers of a single subject, working under practically identical conditions. The first of these, so far as the writer is informed, was the Eastern Association of Physics Teachers, organized in 1895. The last to arrive on the scene is still an infant. Its only excuse for appearing in public consists of several urgent requests for it to describe itself, and the hope that a brief statement of its purpose and plan of operation may contain some helpful suggestions.

The N. E. Association of Teachers of Metal-Working was organized in December 1898 with a membership of fifteen. The addresses of the instructors in metal-working in secondary schools within a hundred miles of Boston having been obtained and a convenient date selected, a meeting was held in that city, around the dinner table at the United States Hotel. The twelve gentlemen present soon became acquainted, and each expressed his views about the character and possible usefulness of the proposed club. The pioneer society just referred to served to some extent as a model.

What seems to have been wise counsel saved the club from exhausting itself at the outset with details of organization. There were a few things we knew we wished to do, and we set about doing them with as little formality as possible, leaving the constitution and even the name of the club to grow. Even in so small a club the territory covered was found to be so great as to discourage very frequent meetings, so but two were planned for, one in April and another in December. To fill in the gaps and keep the members in touch with each other a novel system of correspondence was proposed. Three officers were elected, forming an executive committee with full power, an assessment of 25 cents was collected, and the club was launched.

The executive committee had been selected with some regard to its being able to meet frequently At its first meeting the correspondence plan was put in operation

by "Circular No. 1," which began as follows: "In accordance with a suggestion made at our recent meeting in Boston the committee propose to pursue, as an experiment, the following plan: About the middle of each month a circular will be issued containing such announcements, reports, and items of information as are likely to be of interest. A return blank will accompany each circular, containing such questions as the committee may need to ask in order to carry on the work. Members are asked to send in on this blank requests for information of any sort, or suggestions which they desire to offer to the committee or the club. These returns will aid the committee in preparing the next circular, and the cycle will be repeated indefinitely."

With this circular was sent a list of members, with their addresses, each name being given a number to be used in referring to its owner in future correspondence. Return sheet No. 1 contained, among others, the following items, with spaces for replies: (1) a request for the personal history of each member, including his professional training and his business and teaching experience; (2) a request to recommend reference books; (3) a request for the names of the technical papers to which each member subscribed; (4) an invitation for suggestions or queries.

From the replies to item 2 the committee issued with their second circular, "Bibliography Sheet No. 1," containing a list of eighteen books. It was discovered that sixteen periodicals were regularly seen by the members, and each was requested to report all articles of special interest in some one paper. Special bibliography return blanks were supplied. Four bibliography sheets have thus far been issued, containing information concerning forty-nine books or articles.

A request was received on the first return blank for suggestions for a first exercise, or model for the planer. This was made an item on return sheet No. 2, and Circular No. 3 contained a list of eight such exercises, the author of each being indicated by his number. Information as to methods of supplying working drawings to pupils was sought, also in regard to class visits to manufacturing establishments. Reports upon these matters were gathered and sent out. The personal history returns were carefully edited and proofs sent for correction. The resulting report, besides being very interesting, served to make the members better acquainted.

Enough has been said to illustrate the working of this system of correspondence. By it a meeting has been planned, the distribution of blueprints and printed matter has been facilitated, a new member has been admitted, various statistics have been collected and reported, and a number of topics have been suggested which will serve as the subjects of special reports by individuals, to be passed around in rotation. The secretary has spent some time tabulating returns, and the executive committee has met twice a month. One or two items have come to have a permanent place on the return sheets, for example, suggestions of "possible models." The circulars have been done on the typewriter, mimeograph, and neostyle, this work being mostly paid for out of the club treasury. There are now nineteen members. It is estimated that an annual assessment of $2 will cover all expenses connected with ten circulars, including postage both ways and some printing. Of course, the interest varies with different members and at different times in this, as in any club work; but the plan has the advantage that those who put the most into it are likely to get the most in return. The committee have found themselves well paid for the time they have spent; and by inclosing addressed, stamped envelopes, they have usually obtained prompt returns.

It is not difficult to find material for a meeting of such a club. The chief danger is that too ambitious topics will be selected. The purpose of the organization is to

study details, of which there are many, and every member is interested in them all. The spring meeting was held in Providence, with an attendance of nineteen members and guests. The program included a visit to the Providence Manual-Training High School, an exhibit, and a literary program of three numbers. Nearly half of the club visited the shops of the Brown & Sharpe Manufacturing Company on the afternoon previous to the meeting.

Usually, when a paper upon a special branch of manual training is presented in a large meeting, it is too vague to interest particularly those who should profit most by it, or else, if specific, it is so intensely interesting to them that the discussion, while very enthusiastic, is largely confined to rather minute, technical details, and fatigues the majority in the audience. The study of any particular subject can surely be pursued more profitably in a small, compact club of specialists, and the result ought to be less superficial The society of physics teachers, mentioned as the pioneer of such clubs, has already proved of great service, not only to its members, but to the cause of education. Is there not a work for similar clubs in other fields ?

ALLAN K. SWEET.

CHICAGO MANUAL TRAINING ASSOCIATION.

"SHOULD special work for the schools be done in the Manual Training Department ?" In other words, shall the boys in the manual-training workshop make picture-frames, sand-modeling tables, stools and the like for use in the schools of which they are members ? This was the subject under discussion at the regular monthly meeting of the Chicago Manual Training Association at Handel Hall on Saturday morning, December 9.

Two papers were presented, one on the affirmative, and one on the negative side of the question. These were followed by a general discussion. Mr. G. A. Hancock, who presented the first paper, said that he realized that, having the course of study mapped out, it was burdensome to have to do something to beautify the schools. "But," he added, "because the work is burdensome is no reason that it is wrong. We are told by all educators, and not alone by educators, that our schools should be and must be made homelike. Now, if you are going to do work to increase the attractiveness of the home, it is just as erroneous as it is to do it for the school." He then emphasized the importance of the school, as a public institution, and showed how important it is that the children should feel some personal responsibility in the school. "There is no better way you can drill a child to feel a personal interest and obligation to this institution than to have him do something that is a part of it, no matter how small the mite he bestows." In this way he comes to a full realization of the fact that it is his, "and he is sure to prize it and protect it." Mr. Hancock would not spend all his time in decorating the building but he urged work in decorating as a most effective means of inspiring pupils to put forth the desired amount of energy.

The second paper was read by Mr. Frank A. Fucik. In his opening sentence Mr. Fucik said that "there are so many fundamental points of agreement" among all those who are interested in manual training, that it is difficult to account for the great divergence of opinion. He would not advocate that a rigid program of manual training be followed, but "that some sequence should be observed" in the exercises. He argued for the "systematic evolution of the system." Continuing, he said, "Manual

training should be a part, not of the trade instruction of the mechanic but of his preliminary training. It is of greater importance that it should provide educative exercise for the faculties of the boy than that it should exercise him in the use of tools and in the methods of the workshop. It is on this account that I would advocate the making of a course of exercises best suited to the requirements of pupils in elementary schools; and I deprecate the introduction, at this stage, of exercises which are only suitable for the workshop. The progress of the exercises should be such as to manifest to the pupil his constantly growing power; we should never, at any stage of the work, ask a pupil to do what he cannot do well. His work in manual training should be a line of continuous victories over difficulties, the work gradually increasing in difficulty, but not surpassing his power at any stage. Continual failure is worse than no attempt at all."

Mr. Fucik's favorite expression in characterizing the "special work" under discussion was "haphazard exercises," which seemed to indicate that he believed that, working under the conditions prevailing in Chicago, the making of apparatus and articles of furniture for the schools is demoralizing.

In opening the discussion of Mr. Fucik's paper, Mr. Hancock raised the question of correlation with other school studies. At this point Colonel Parker, president of Chicago Institute, who had entered the room in time to hear the second paper, was called upon. His first sentence was the turning-point in the meeting; everybody was alert and responsive after that. He said, "I am absolutely opposed to the paper;" and he added his reason, "it is unpedagogical." He then continued, in substance, as follows:

"There are two aims in education which may be traced in history. The one is education to prove a dogma, to establish a hierarchy, and to use the schools as a means of making subjects. The other is education to set the human spirit free. Even in this new country of ours, liberty seldom enters the schoolroom. Marks of the old are all about us here. We see them in the tyrannical school boards, in the heads of school system, who insist on having uniformity — uniformity is absolute tyranny; we see it in the supervisors who demand that stated kinds of work be done on certain days or hours throughout the schools of a city. This, too, is tyranny, and we, in this country, think we have to bow to it. To put down a course of study and say that every teacher shall follow it is tyranny. Manual training is the youngest child of our educational work. Shall we allow this tyranny to crush it?

"The influence from abroad is all in that direction. The Russian system comes from a country where all is tyranny; the purpose of education is to make subjects. What is left out? The moral. The child does not know that the thing he is making has any use. Consider the difference between a boy's doing things he knows he must do, and making things useful in his home or his school. Your aim should not be skill, but function. Skill comes incidentally. A child is making something useful; it won't function. Try again. The teacher must be the judge of the pupil's ability and must guide him in his choosing. But it is tyranny not to give a child a chance to choose."

Mr. Brockman said that he thought Col. Parker took too extreme a view; he presupposed that things made in the manual-training classes are not useful, and that the boys cannot see the use of them. This is not the case. The question under discussion arises from the fact that requests from the principals interfere with the course of instruction. Mr. Brockman believed a course of study to be necessary, and that it is not good pedagogy to have the boys make sand-modeling tables and the like.

It came out at this point that the present interest manifested in the subject under discussion was due, in part, to either a rumor or a fact that the new supervisor of manual training in Chicago, Mr. R. W. Smith, is going back to abstract exercises and the rigid course of study which had been gradually grown away from by his predecessor. It appeared, then, that Mr. Brockman had been thinking of conditions of the recent past under Mr. Beardsley, while Col. Parker had been speaking a word of warning against what is expected in the near future. Of the past, Col. Parker said: "The work done has been glorious. No school system in the world ever made such an advance as Chicago, in constructive work."

When this point had been cleared up, Col. Parker made the following reply to Mr. Brockman's statement concerning the desirability of having a course of study. "I object to having a course adapted to the average child. Real teaching adapts to the individual child." In further discussion of this point, Col. Parker asked this question, referring to the kind of constructive work which he advocated: "Are you sure that all the exercises do not come into logical sequence?" meaning, of course, for the individual child. He then added: "The good thing about Salomon's sequence is that all the models are useful in Sweden; the bad thing is that it lacks adaptation to individuals."

Mr. Bennett, of Peoria, was asked to take part in the discussion. He related incidents in his experience in order to point out that, after all, it is not so much a question as to whether this "special work" should come into manual training, as it is a question of how it shall be regulated, and what should be the spirit in which it is undertaken. The originality, adaptability, enthusiasm, and point of view of the teacher are all-important factors in such work. It takes more of a teacher to do such work successfully, than to follow a prescribed course of models. Mr. Bennett said he had no sympathy whatever with haphazard work; he wondered that educators should be deceived by it. He saw nothing impossible in the proposition to follow the principle of adaptation to individual needs, while at the same time holding to a plan of work which determines what *not* to do, at certain stages of the work, rather than, definitely, what to do. Such a plan gives ample scope for individual initiative and choice, without the loss of valuable training that comes with working together on problems of the same general class.

Mr. McMurray said that he encouraged the making of things for the home, and then told of an interesting experience in putting up a gymnasium. The boys worked in groups and learned to plan their work ahead. In such work, both the individual and the community ideas find an application. — EDITOR.

WISCONSIN EDUCATIONAL ALLIANCE.

In response to a circular letter of invitation sent out by Senator J. H. Stout, of Menomonie, Wis., a number of men and women prominent in educational circles of the state, met at Madison, November 18, in the office of the Superintendent of Public Instruction, with the object of forming what is called the "Wisconsin Educational Alliance."

Among those in attendance were State Superintendent L. D. Harvey, Dr. J. W. Stearns, Professor M. V. O'Shea, and Dean J. B. Johnson, of the University; W. D. Parker, State Inspector of High Schools; City Superintendent R. B. Dudgeon, of

Madison; Librarian F. H. Hutchins, of the Wisconsin Free Library Commission; Superintendent J. E. Hoyt, Menomonie; Superintendent Upham, of Whitewater; and Dr. M. P. E. Groszmann, Mrs. Charles Morris, and Mrs. Merrill, of Milwaukee.

Senator Stout was made temporary chairman, Dr. Groszmann temporary secretary, and, after some discussion, a resolution was adopted expressing the sense of the meeting, that such an organization as it was proposed to make the Alliance was needed and should be formed.

Further discussion followed as to the aims of the Alliance, and how these could best be promoted, after which, upon motion, Senator Stout was made chairman of a committee of five, to be named by himself, who were to formulate and report a plan of organization. The conference then adjourned.

In the words of the circular, "For some time past there has been, among patriotic and enlightened men and women in all parts of the Union, and especially within our own state of Wisconsin, a strong desire to promote a higher philosophical standard, and better methods in the public system of education," and it is this desire, coupled with a keen sense of the responsibilities resting upon teachers, school officers, and all those having charge of the training of the young, which has crystallized in the formation of the Alliance.

The organization does not propose to foster any particlar educational movement to the exclusion of others, but aims to band together in a practical working whole all associations and individuals in Wisconsin, whose efforts are to better the "educational environment" of the child.

Quoting again from the circular letter: "We owe most of this new awakening to a new science which has sprung up in recent years, as an outgrowth of an intercorrelation of several other sciences, such as psychology, physiology, anthropology, and others, and which, under the name of "Child-Study," has focused the interest, otherwise scattered, by concentrating it upon the "heir of ages," the child. The theory of organic evolution has given strength to this new departure, and we now understand the child to exhibit, in the course of his growth, from infancy to adult age, a series of successive developmental epochs, which, while making him very unlike the adult at each individual stage, can roughly be compared to the successive stages that are historically and biologically evident in the evolution of civilized man, and each of which must be understood in its causes, symptoms, and effects, if a wholesome growth towards sane maturity is to be secured.

"In the same way the natural instincts of the child that manifest themselves at these different stages have become more justly estimated in their educative significance. In conformance with the recognition of the constructive genius of childhood, and of the striving of the mind for conceptual unity, a plea is made for a rational method of instruction: the objective, creative, experimental method as against the book method; and also for correlating the studies taught in the schools so as to form an organized whole. If there were a well-articulated and coördinated course of instruction, there would be mathematics in the workshop, history in the art studio, and better logical training than grammar affords to the elementary mind in the science laboratory. The spirit of this method, it is asserted, must pervade all school work so that there be reality instead of names, experience and practice instead of mere rules, self-expression instead of routine work, individuality instead of a common average. Such a method would be an appeal to the natural instincts of the children who delight in objective and constructive activity, and whose play instinct is gratified by this work.

Thus, *manual training*, as it is somewhat inappropriately called, or, better, the principle of "*learning by doing*," which has had its first systematic and comprehensive recognition in the practice of the kindergarten, becomes, as it were, the keynote of educational progress in its methodical manifestation in the schoolroom.

"But the new movement comprises more than methodical devices. Being based on child-study, it demands, to be sure, the introduction of the objective, constructive, correlative methods; of manual and art culture; a recognition of the kindergarten principle as the basis of instructional reform through the grades; it urges the concentration of studies at proper stages; the installment of courses in domestic science and art — in nature studies by way of experiment, observation, and excursions, as well as through systematic school gardening as the first step toward rational agriculture. But it is vastly more comprehensive, and includes all phases of rational education, at home, in school, and through the general environment. It lays stress upon the physical education of children as a necessary prerequisite of sound mental and moral development, and in connection therewith upon hygienic and sanitary reforms, and the establishment of medical school supervision and regular measurements of the children. Among other important points to which this movement has directed attention, there may be mentioned: Public child nurseries (creches); public day asylums; schools and classes for defectives; playgrounds, playschools, and vacation schools; summer outings and camps for city children; school architecture; the creation of an esthetically inspiring environment by decorating schools and schoolrooms; school preparation for maternity and paternity; parental apprenticeship in the kindergarten; juvenile literature; the better training of teachers, etc."

It will be seen that the Alliance, while enrolling teachers among its members, is not a teachers' organization as generally understood, but enrolls in its ranks intelligent men and women possessed of wealth, culture, and refinement, who desire to help along in the educating of the rising generations and require to be shown how they could best do this.

An association like this is bound to exert a powerful influence for good in this state, and its friends expect and hope that its ability to aid educational progress will not be confined to Wisconsin.

J. H. Mason.

PROFESSOR FORBES BEFORE THE ROCHESTER LABOR LYCEUM.

At a meeting of the Labor Lyceum of Rochester, N. Y., October 29, 1899, Professor George M. Forbes of Rochester University delivered an address on the "Curriculum of the Public Schools." This address is considered particularly significant at the present time owing to the fact that Professor Forbes has recently become a member of the Rochester Board of Education. The following is an abstract of it:

"The importance of the public school depends upon the fact that the vast majority look to it alone for their education. The problem of what shall enter into this education is the fundamental problem of the public school. The education is not an end in itself; it is a means to a further end, and no attempt can be made to determine a proper curriculum until the ends which it is to serve are clearly defined. The supreme end of education, supported by general taxation, is to develop good citizens, and it will be generally conceded that the first requisite of good citizenship is intelligence.

The public school must therefore, first of all, include such studies as will render the pupils intelligent.

"The intelligent man is the one who is capable of forming correct judgments of the world about him, who has the capacity to see and reason correctly. This capacity, like all others, can only be developed by exercise, and there are but two spheres of truth directly accessible, viz.: nature and man. Any curriculum designed to develop intelligence must center in these, and hence the public school must include elementary studies of nature and man.

"Intelligent control of nature requires an answer to these questions: what? how much? and why? The answer to the first gives quality or kind, to the second measure or quantity, to the third order or law. The processes which yield these answers are observation, calculation, generalization. Of these we have hitherto put the whole emphasis upon calculation, and ignored the other two. The result is that arithmetic has a disproportionate place in the curriculum, and, separated from its natural correlation with the result of observation, it has become the dry and formal manipulation of symbols. Children go through our schools with their eyes closed and their minds unresponsive to the marvelous world around them. The quantitative and qualitative should go together. Nature study and observation are alike essential elements in the curriculum.

"Intelligent coöperation with our fellow men requires, first, the mastery of the means of communication, in the ability to speak, read, and write our native tongue. Language is the vehicle by which sympathy is awakened, by which man influences man. It requires, second, some knowledge of the mighty industrial system by which our wants are supplied, and our material civilization built up and sustained. This can be learned even at the breakfast table, where forces absolutely remote are brought together. How remote are the people who helped to furnish that breakfast. I requires, third, some knowledge of the practical framework which holds society together, its origin and its history, so that the pupil might not rush to revolution but seek to develop by evolution. There are then two groups of studies. Nature study and observation form the one; language, economics, civics, and history form the other. The one pertains to nature, the other to man.

"Between these groups there is a connecting link, geography. The importance of geography is due to the fact that mere place, mere location, conditions both natural forces and human effort. Thus geography is the study, primarily, not of location, but of what may correctly be called the law of location, that is, of the way in which location conditions and determines the forces of nature and the efforts of men. This is the conception which is revolutionizing the study of geography, changing it from a mere memorizing of locations to a study which challenges the full power of the intellect in grasping the way in which all physical, industrial, and political forces are influenced by their local distribution. It is evident that it rests upon nature study as an indispensable prerequisite, while economics and history are in turn dependent upon it; and these relations are indicated by the natural divisions of physical, economic, and political geography.

"These studies will render the pupil an intelligent citizen, but he should be rendered efficient as well as intelligent. He learns nature in order to master it, and he learns man in order to coöperate with him in securing their common good.

"Efficience is the power to transfer thought and imagination into objective realty. Here, as before, the problem relates to nature and man; how to transform nature and

influence man. The hand symbolizes efficiency in the one process and the tongue and pen in the other. The public school should develop power in both directions so far as the capacity of the pupil will permit. Manual training is only just finding its place in elementary education and yet its educational value is unquestionable. Our whole material civilization, our whole industrial system depends upon the transformation of woods, metals, fabrics, and foods, and it is astonishing that the schools which educate all our workers should utterly ignore the constructive process by which these transformations are effected. The purely educational value of manual training is threefold: it gives the systematic motor training essential to complete brain development; it is often the only way to a living interest in other subjects; it delivers the pupil from idle dreaming by familiarity with the actual conditions of material achievement. It gives a practical discipline, analogous to the intellectual, namely, the power of sustained effort for remote ends. It gives training which will increase the efficiency of all subsequent effort. Its value to the public is in promoting intelligent workmanship, industrial progress, the mobility of labor, bringing added comfort, health, and happiness to countless homes, and begetting a universal sympathy with labor and an appreciation of its inherent dignity. The child must be able to incarnate what his mind conceives. The public schools should have such an element which not only teaches to know, but to do.

"The public school must also develop in the pupil some degree of refinement. Refinement, when it is genuine, is the result of culture, and culture is the capacity to appreciate and enjoy the beautiful, the ideal. It contributes to the common good in that it delivers the individual from mere sensual enjoyment. There are many ways of developing a refined taste: by nature study, by dress, by decoration, by song, by graceful movement, but the richest treasures of culture are embodied in literature and its flower is in poetry, and so this is preëminently the culture study, and there should be living contact with good literature from beginning to end of the course.

"Certainly the public school must, by every means in its power, make its pupils moral. There are two aspects of morality which should be developed in their natural order. The first is the recognition of the rights of others, and its product is justice; it prevents aggression. The second is the recognition of obligation to others, and its product is sacrifice and unselfish devotion to the common good. If the republic is to continue, these qualities must pervade its citizenship."

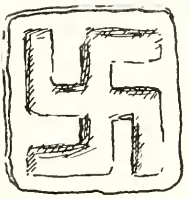
AN ARTS AND CRAFTS CLUB.

THE boys of our school had already organized a flourishing Engineering Club when someone proposed that an Arts and Crafts Club be formed which should admit to membership the girls as well as the boys. The Engineering Club was making itself popular by supplying illustrated lectures on engineering subjects and by conducting Saturday excursions to power plants and factories, and it was thought that all this interest in things mechanical should be offset with an interest in things artistic.

A meeting was called, a committee on constitution appointed, and in a few days a very simple constitution had been adopted and officers elected. The purpose of the Club, as stated in the constitution, was to "recognize and encourage artistic handicrafts" at Bradley Polytechnic Institute. The officers at once became conscious of the fact that there was no artistic work in the school to "recognize," and that the Club

therefore, for the present, must confine its efforts to encouraging the production of something that could be recognized as having artistic qualities. A photography exhibition was suggested as furnishing a good starting point. This met with popular favor at once. As soon as the notice of the exhibition had been posted and the exhibition committee had begun its work, it was surprising to learn how many photographers were connected with the school.

True to the Arts and Crafts idea, the Club decided to make its own catalogues. The size and shape of these were decided upon, and the members of the Club were urged to contribute covers of their own design and making. Some members easily exhausted their fund of ideas on a single cover, while others made a round dozen. Taken together they were an interesting lot. The body of each was a mimeograph print from a type-written stencil, but the covers varied from a dash at freehand lettering to a dignified book-cover effect, and from a velox print of a bit of landscape mounted on gray paper to an elaborate design in colored inks. Narrow ribbons of different colors were used in binding.



THE FYLFOT

The exhibit was hung on screens made for the purpose out of pine shelving covered with unbleached muslin and then painted. The construction of these was such as to allow of their being placed either end to end or at right angles to one another, thus producing a wall surface uninterrupted except by the joining line. The feet held the screens in place, either close to the wall or in the middle of the room. When completed, the exhibition contained 255 pictures, some of which would have done credit to any exhibition of amateur photography. In connection with the exhibition a practical talk on artistic photography was given by one of the teachers in the School of Horology, who is also one of the most expert amateurs in the city. A committee of local experts reviewed the exhibit, calling attention to its best features and suggesting improvements for the next exhibition.

As soon as the photography exhibition was over the Club began to look about for its next opportunity, and was not long in deciding to hold a small exhibition of one-cent reproductions of masterpieces of architecture and sculpture. This exhibit was placed on the landings of the staircase, so that every student in the school would be obliged to see it. The exhibit was classified — Egyptian, Greek, Roman, etc.— and in the middle of each of the screens upon which the exhibit was mounted was a small sign which read, "This exhibit shows what kind of pictures can be purchased at one cent each. It also suggests a good way to begin the study of the History of Art — by collecting good pictures and facts concerning them." Under each picture was a type-written paragraph explanatory of the picture; thus, under "The Coliseum," one might read, "a circular building arranged for the exhibition of combats of gladiators and wild beasts and for sham sea fights. It was commenced early in the reign of Vespasian and completed by Titus, who dedicated it in the year A. D. 80. It seated 47,000 people." These paragraphs were prepared by members of the club, a number of pictures being assigned to an individual or to a group of individuals, as seemed to suit best. The result of the exhibition was just what had been expected. Between recitation periods groups of students could be seen studying the pictures and conversing about them.

During February and March a series of seven talks on paintings was given under the auspices of the Club by the teacher of freehand drawing. These were at

4:15 o'clock in the chapel and were illustrated by a large number of lantern photographs, several of which were made by a member of the Club — our leader in photography. The others were rented in Chicago with the money obtained from the sale of catalogues at the time of the photography exhibition. As these talks were sure to be interesting to many of the parents and friends of the students it was decided to send out announcements of the course. The Club could not afford to pay the price of artistic announcements which should be made in the usual way, so the question arose, "Can't we do most of the work ourselves?" The Club had previously been given permission to use drawing paper belonging to the Institute whenever it was needed, and the father of one of the members had promised to do printing for the Club at reduced rates. A meeting was held to talk over possibilities, taking into consideration the limited resources of the Club. The result was a neat folder three and a quarter by four and a half inches, printed in blue ink on the cheap, rough manilla paper used for sketching. The sheets were torn to the proper size by members of the Club, and thus the edges were left rough. The president of the Club, a member of the class in metalworking, made a sharp-edged sheet-metal form by which sheets could be torn to the proper shape and size for envelopes. These sheets were folded and finally sealed with wax. "But what shall we use for a seal?" some one asked. A member from the school of Horology immediately replied that he would engrave a seal if the Club would adopt a design. A happy decision was reached in the fylfot which has since been advertised so much as Kipling's trade mark. Whether our Club or Kipling has the prior claim to this ancient swastika we do not know, but we are sure of this, that we are very willing to share the use of our seal with the author of *Captains Courageous*.

Another of the club's pleasant events was a talk on "Stained Glass" by a local architect. This was given at St. Paul's Church, where good windows could be used for illustration. But none of the events of the year — neither lectures nor photography excursions nor sketching trips — were of so great importance from the Arts and Crafts viewpoint as was the final spring exhibition. In this were gathered together the best pieces of work, exclusive of photography, that had been done in the classes during the year, together with such others as members of the Institute were willing to contribute. More than a dozen different arts and crafts were represented in the 150 pieces on exhibition. Besides sketches in pencil and pen and ink, paintings in oil and water color, there were book-cover designs and pictorial compositions. Wood-turning was represented by cups, trays, boxes, and the like; wood-carving by book racks, ink stands, boxes, and picture frames; and bent iron works by useful articles in various sizes ranging from a tiny easel or mat to an umbrella rack or a jardinière stand. Some pieces of "escutcheon work" in brass were contributed by boys who were members of the second year class in metal working. Needle work was shown in a variety of forms. One member contributed a full-sized hammock and the needles, of his own make, which he used in weaving it. Students from the School of Horology contributed samples of engraving, silver spoons, gold rings, pins, and other pieces of jewelry, nearly every one of which was designed as well as executed by the exhibitor. In fact the same might be said of the entire exhibit — most of the pieces were designed by the persons who exhibited them, and in all probability the rules for next year's exhibition will be framed in such a way as to still further encourage originality of design in the pieces contributed.

The room selected for the exhibition was the one that had been tinted green with "cementico" and furnished to illustrate a model schoolroom at the time of the meeting

of the Western Drawing Teachers' Association. Although the furnishings had been removed, the color of the walls remained unchanged, and this color was admirably suited to our purpose. In order to have the entire background of the same tint, the screens and some of the tables upon which the exhibit was shown were given a coat of this same green. To add to the attractiveness of the exhibit a few casts were brought down from the drawing room, several bits of drapery were contributed, and, through a friend, an ample supply of potted palms was procured. Catalogues were printed on gray drawing paper and sold to visitors. A flaming poster on the bulletin board and a few generous notices in the city newspapers brought many friends to the exhibition. When it closed the members of the club had a right to feel proud of their year's work. But during the year the ideals of the members had been developing as fast as their skill in handiwork, so that the prevailing sentiment at the end of the year seemed to be, "We can do better next time."

CHARLES A. BENNETT.

BREVITIES.

COLUMBIA UNIVERSITY has announced a summer school for 1900. At least one of the twenty-five courses to be offered will be manual training.

THE Eastern Manual Training Association promises to furnish its members during the coming year with a new bibliography of manual training, revised to date. The bibliography published by that association in 1898 was the most complete of any in the English language, and it has been much appreciated by students of education throughout the country. Why do not other associations of manual-training teachers undertake similar lines of work?

THE teachers in the public schools of Menomonie, Wis., together with the general public, are enjoying a series of free lectures upon educational topics given by Maximilian P. E. Groszmann, Ph.D., formerly director of the Workingman's School, New York City. These lectures are provided through the generosity of Senator J. H. Stout, president of the School Board, and cover a period of two months. They treat upon such subjects as "Significance of the Kindergarten and Its Rational Development," "The New Educational Gospel," "The Manual Principle in Education," "Art Training in the Elementary School," "A Rational Course of Study," "Ethics of Child-Study," "Nature Work as an Objective Basis."—J. H. MASON.

AT the fifty-third annual meeting of the American Missionary Association, held at Binghamton, N. Y., in October, there was an exhibition of handwork done by pupils in the various industrial schools conducted by the Association among the negroes in the South and the Indians in the Southwest. A correspondent says of the exhibit: "The knife-work, joinery, turning, pattern making, forging, and civil-engineering drawing were surely excellent, when one considers the equipment, time given to the work, and the age of the pupils." He then quotes a teacher from Mississippi, who said that the great difference between the industrial North and the South lies in the fact that so large a proportion of the population of the South are unable to use their hands with any degree of skill, even in the simplest operations.

A GENEROUS gift has been made to the cause of education in Canada by Sir William C. Macdonald. It is an arrangement to bear the cost for three years of an effort to

establish manual-training classes in one centre in each of the eight provinces of the Dominion. A Scotchman has been engaged to superintend the experiment. He has been successful in establishing technical schools in Great Britain, and in his preparation for that work made a study of the manual-training schools of Sweden and Germany. It is planned to establish in a city or town of each province regular classes in connection with the public schools. Pupils will spend one or two days a week in actual work with tools. This work will be supplemented by technical instruction from competent men engaged in various trades.— *The School Journal.*

CALIFORNIA.

A CALL has been issued inviting all those interested in the various forms of manual training, sloyd, technical, and industrial training in California to meet in Los Angeles on December 21. Steps will be taken looking toward the organization of a manual-training association. The meeting is to be held in conjunction with the Southern California Teachers' Association.

AT a combined meeting of the Farmers' Institute Clubs, to be held in Pasadena in the near future, the topic of manual training will receive attention, and the members of the organization be given an opportunity to observe a manual-training object lesson at Throop Polytechnic Institute.

THE value of educational handwork in the Indian schools of the Southwest is being recognized. Already several inquiries have been made of the Throop Polytechnic Institute for teachers along the various manual lines.—ARTHUR H. CHAMBERLAIN.

CONNECTICUT.

THE fifty-third annual meeting of the Connecticut State Teachers' Association was held at the Hartford Public High School Friday, October 13, 1899. The manual-training section was in charge of Principal T. W. Mather of the Boardman school, New Haven. The program was as follows: "Paper Work in Primary Grades," Mary A. Pinney, New Haven; "Woodwork for Boys in Upper Grammar Grades," Thomas D. Jenkins, New Haven; "On Best Methods for Introducing Manual Work into Existing High Schools," Charles H. Keyes, Principal South Schools, Hartford. The papers were interesting and valuable, and a general discussion followed each. A large and comprehensive exhibit of drawing and manual training from all over the state was displayed in the gymnasium. This feature of the meeting was enjoyed by the public at large as well as by the teachers in attendance.— C. B. HOWE.

WASHINGTON, D. C.

THE objective side of the public school instruction of Washington, D. C., is to be shown at the Paris Exposition by a series of photographs. Some idea of the extent this feature has reached can be obtained from the number of these photographs, which is 344. They are platinotype prints, eight by ten inches, and are the work of Miss Frances B. Johnston, whose name is an assurance of their high artistic and mechanical excellence. As the aim was to show the actual conditions obtaining in the schools there were many difficulties presented to the photographer, hence her success is the more commendable. Manual training is well represented in the collection.

PLANS for manual-training high schools both for white and for colored pupils have been accepted. The former would now be in process of erection except for the

advance in the cost of materials since the appropriation became available. This has necessitated a delay in order to obtain additional funds from Congress. A description of the building may be expected in the next number of this *Magazine*. Henry Ives Cobb is the architect. The colored school will probably be ready for occupancy as soon as the other, although its construction was authorized a year later. W. B. Wood is the architect.—J. A. CHAMBERLAIN.

CHICAGO.

MANUAL training in the elementary schools of Chicago has undergone a radical change this year. Mr. R. F. Beardsley, who has supervised the work ever since its introduction into the grades below the high school, retired and accepted a place as teacher of mathematics in the English High and Manual Training School. Mr. R. M. Smith, who for several years has been principal of the John Worthy School at the city prison, was elected to the position. Mr. Smith has had a long experience in the study and practice of industrial education. He is a graduate of Glasgow University and at the same time is a thoroughly trained mechanic. At present he is working at the problem of a course in manual training for the lower grades. He appears to have very nearly solved the problem in his course of exercises in paper and cardboard construction. His work has been well received by the teachers in the elementary schools among whom he has been holding institutes. The winning of the teachers is no small part of the work when introducing anything new into the school curriculum. Superintendent Andrews speaks very enthusiastically of this proposed course. Thirty-eight teachers are now employed in the manual-training departments of the elementary schools. The schools are grouped around some central school to which the pupils are sent one period per week to receive instruction in tool-work. There are thirty-six of these centres. Many more are needed and some are being urgently demanded by the patrons of certain schools. The matter of extension is at a standstill for the present, but after January 1, 1900 the new appropriation will be available, and it is expected that manual training will get a generous allowance.

THE question of a new site and building for the English High and Manual Training School is still undecided. The school has enrolled 578 the present year to date with accommodations for 450. When we shall reach the limit of our elasticity is an open question. Eight teachers are employed in the shops, three in the drawing rooms, and ten in the academic work of the school. Two more academic teachers are urgently needed, but we have no place for them to work.

A MANUAL-TRAINING teacher in Chicago in the future must be considerably more than a mere mechanic who has made "many an apprentice," as we often hear it expressed by candidates for position as teachers. By a regulation of the Board of Education adopted February 21, 1899, it is provided that "Applicants for certificates as Manual Training teachers be required to show to the Superintendent of Schools, prior to the examination, evidence that the applicant is a graduate of the Chicago Normal School or other normal school of equal grade, or that the applicant has had at least four years successful experience in teaching, or is a college graduate with one year of pedagogical instruction.

THE annual conference of high schools and academies was held at the University of Chicago November 10 and 11. On the latter date the discussion at the general meeting was one of peculiar interest to any one engaged in manual-training work.

The question was "The Relation of Higher Education to Success in Business Life." It was discussed from the side of the college by Professor A. C. Miller, of the University, and Professor H. W. Thurston, of the Chicago Normal School, and from the business man's standpoint by Mr. A. C. Bartlett, of the well-known firm of Hibbard, Spencer & Bartlett. It was expected that Mr. Franklin MacVeagh would speak with Mr. Bartlett, but he was kept away by illness. Both sides were in accord as to the value of college training in all walks of life. All such discussion must of necessity be one sided. Statistics show that only about one fourth of 1 per cent. of the people have received a college education.—A. R. ROBINSON.

THE South Side Academy, closely connected with the University of Chicago, has just begun work in manual training. Mr. Frank H. Ball is the teacher in charge of this new department.

THE Chicago Institute, the new school of pedagogy founded by Mrs. Emmons Blaine, of which Colonel Francis W. Parker is president, will be open to students for the first time during the summer of 1900. Manual training and art work will be given a prominent place in the work of this school.

THE Chicago Manual Training Association held its annual meeting November 11. The following officers were elected for the ensuing year: President, John A. Toomey; vice president, Albert J. Brockman; secretary and treasurer, Frank A. Fucik; corresponding secretary, Gustavus A. Hancock.

MR. F. DUNDAS TODD, editor of the *Photo Beacon* of Chicago, is at work on a series of small handbooks on "Useful Arts and Handicrafts." Many of these will be revisions of the works of Charles G. Leland, the founder of the Public Industrial Art School of Philadelphia, and the author of many books on the minor arts. One of the first to appear will be the book on wood carving, which has been revised and fully illustrated by Mr. Frank H. Ball. It is evidently the aim of the editor to produce a series of inexpensive books which will be of value to teachers as well as to those who wish to learn such of the minor arts as will enable them to beautify their homes.

NEW YORK CITY.

AN exhibition of the work done at the Vacation Schools of the Boroughs of Manhattan and the Bronx was held at Public School No. 1 during the week ended November 18. Samples of the articles made were displayed in great variety on a series of tables and exhibit boards, which filled the large assembly room of the school building, the quality of the work indicating the care and industry of the pupils as well as the ability of their instructors.

Ten school buildings in the most densely populated quarter of the city were utilized for this vacation work, each designed to accommodate 500 children. The average daily attendance was 4500, of ages ranging from five to fifteen years. The industrial classes were composed of children of twelve and upwards, the boys being taught woodwork in several branches, such as whittling, carving, fret-sawing, toy-making, and cabinetmaking, besides Venetian iron work, clay modeling, cardboard construction, etc., while the girls received instruction in domestic science, cooking, dressmaking, sewing, embroidery, and other kindred branches. The classes were in operation for a period of six weeks, working three hours a day.

Great credit is due to the Committee on Special Schools, who had this experiment in charge, and so successfully carried it through.

THE teachers of shop-work in the public schools of Manhattan and the Bronx have formed an association for the discussion of matters pertaining to their special line of work. At a recent meeting Mr. A. W. Garritt was elected president, and Mr Robert G. Weyh secretary. Meetings are held monthly at Grammar School No. 30.

A MEETING for the purpose of soliciting aid for the Tuskegee Normal and Industrial Institute was held at the Madison Square Garden Concert Hall, December 4. Ex-president Cleveland had consented to preside, but was prevented by illness from attending. A letter from Mr. Cleveland, which was read at the meeting, announced that a western lady had offered, through him, to contribute $25,000 toward the endowment fund upon condition that other subscriptions to the fund should aggregate the same amount. The Hon. Carl Schurz took Mr. Cleveland's place as chairman of the meeting. Addresses were made by Dr. Booker T. Washington, Principal of the Institute; Mr. W. H. Baldwin, Jr., and others. Many influential New York men occupied seats on the platform and in the boxes.

Several contributions were handed to Mr. Washington after the meeting, and the announcement was made in the papers the following morning that Mr. and Mrs. Collis P. Huntington had given $50,000.

VISITORS to Teachers' College who are interested in manual training will be impressed by the great activity displayed throughout that department. Both school and college classes are fuller than ever before, and the workshops are overflowing. A new departure this year is the rule requiring all boys of the Horace Mann School in the first high-school year to take instruction in joinery. This had previously been required only in what was known as the general branch, a comparatively small section of the high school. Girls in the same grade, if they so elect, are permitted to take joinery instead of sewing and cooking.

AN exhibit, which is in course of preparation for the Paris Exposition, is designed to give a general view of the work of the college, graphically illustrated (in both senses of the term) by photographs, charts, and models. It is not proposed to send full courses of models illustrating lines of work in manual training, but merely a few specimens suggestive of the six stages of college instruction, viz., kindergarten, primary, grammar, high school, college, and university, consisting mainly of constructive and representative work, sequentially arranged. These specimens will be exhibited in counter cases, the charts, photographs, etc., being mounted on wing frames. Plans of the new Horace Mann School will be included in the exhibit.

THE New York Trade School begins the year with an enrollment up to December 1 of some 580 students, a considerable increase over previous years. A recent addition to the school buildings contains the new department of electrical work, the assembly hall, and the department of sheet-metal cornice work.—W. F. VROOM.

EDITORIAL.

One who pays attention to the trend of events in the educational world cannot fail to recognize a deep and growing interest in manual training. Neither can he fail to see that manual training is rapidly taking its place among the subjects that are considered essential to the fullest and truest kind of education. Gifts of large sums of money by individuals; the actions of boards of public education, appropriating tens of thousands of dollars; discussions at club meetings; articles in the newspapers and in numerous other periodicals; public addresses and books by men and women of the highest standing and widest influence in educational matters; organizations formed to promote manual training: all these present unmistakable evidence of interest and activity, and convincing testimony as to the value of manual training.

Moreover, it does not require very close observing to recognize that the quality as well as the quantity of this activity is most encouraging. Manual training is much more generally understood now than formerly. Enthusiasts are becoming more moderate, or at least more rational in their claims, and just in proportion as they become so they are gaining the support of thinking men and women. This statement is well illustrated by a sentence which appeared in the editorial column of an eastern daily paper on account of Secretary Hill's article in the October number of the Magazine. The editor heartily approved of the article but disapproved of the claims of certain local enthusiasts. He said: "Manual training is a useful discipline, but it will not bring the kingdom of heaven down upon earth, as some of its supporters seem to think." There is a vast difference between the kind of activity that should be and is most evident in manual-training circles today and the kind that was in vogue fifteen or twenty years ago. The activity in those days was largely that of the reformer and the agitator, while the activity of today is that of the investigator and organizer. What was most in demand in those days was impressive oratory, whereas today our greatest need is for devoted teachers, clear thinkers, skillful organizers. We still need earnest advocates, but first of all we need

and must have men who are master teachers and practical students of pedagogy — men who can and will put themselves into vital, sympathetic touch with the lives of the particular children they have to teach, and then will observe and investigate and think and apply. It is encouraging to believe that manual-training teachers, as a class, are making their own observations and doing their own thinking, and that they are every year becoming more and more efficient.

The leading article in this number of the MAGAZINE is by one of the youngest of our educational leaders. Professor M. V. O'Shea was born in Leroy, New York, in 1867. He received his early education in the public schools of his native town. Later he was fitted for college at the Leroy Academic Institute. Before entering college he taught school for three years, at the end of which time he was granted, upon examination, a life teacher's certificate for New York. He graduated from Cornell University in 1892, receiving a special diploma for excellence in philosophic studies. Immediately after graduation he was elected to the professorship of psychology and pedagogy and the directorship of the practice school of the State Normal School at Mankato, Minnesota. From here he was called to the Buffalo School of Pedagogy, where he held a similar position. In Buffalo he gained an enviable reputation through his successful work in adapting the results of modern child-study to the needs of teachers who are working under the conditions of the ordinary classroom. About three years ago Professor O'Shea was called to the University of Wisconsin to take charge of its new School of Education, in which commanding position he now exerts a wide influence on the educational work of the Northwest.

A NEW DEPARTMENT.

At the suggestion of Mr. Walter G. Wesson, Director of Manual Training, Worcester, Massachusetts, we have decided to announce a new department of the MAGAZINE, to begin with the April number. The aim of this department will be to provide a special place for questions and answers and for short articles. Mr. Wesson believes that there are many questions of detail that can be discussed with profit in such a department. We heartily agree with him, and invite our readers to send contributions as soon as possible. The following questions have already been presented for publication in this new department:

1. Which is the best way to treat blue prints to be used by the boys? "I have tried mounting on cardboard, but perhaps somebody has hit upon a better plan."

2. How much latitude in the choice of models should be left to the teacher? and how much can be safely entrusted to the pupil's own initiative?

3. Is there any better method of fixing responsibility for tools for general use than the "check system" so often used in manufacturing establishments?

We hope to receive several brief answers to each of these questions. Drawings or photographs may be sent to illustrate some of the answers.

REVIEWS.

PERIODICALS.

"Manual training is no longer a claimant seeking recognition from the educational world. It is now an accepted part of the most complete liberal training." These are the opening words of an article on the Toledo Manual Training School, by President John Henry Barrows, of Oberlin College, in the November number of the *Review of Reviews*. Dr. Barrows then speaks briefly of the value of handwork as a means in education, and follows this with an interesting historical sketch of the Toledo school. This school claims to be the first manual-training school to be operated in connection with a public-school system and giving equal attention to both boys and girls. He explains somewhat in detail the work of the various departments of the school and illustrates these details by the use of nearly a dozen reproductions from photographs of work-rooms and pieces of work done by pupils. Toward the close of his article he says: "When I was in Poona, India, I was given a pocketknife made by a Brahman, a representative of immemorial priestly exclusiveness. I felt that I held in my hand what might be the death-warrant of the devilish caste system of India. Manual training is becoming a powerful ally of the most effective missionary work in the Orient." And then he adds in another paragraph: "The new education is earnestly advocated by men who have lost none of their appreciation of the supreme value of the literary and classical disciplines. But these disciplines have their limitations, and are not fitted to all. The new system, which is not altogether new, 'teaches that neither the eye nor the hand nor the head can dispense with mutual coöperation and aid.' I have no fear that the college will ever cease to draw appropriate and noble inspirations from Athens and Rome. But wise men are anxious to see the colleges of our country brought into closer connection and more vital relations with the industrial and commercial world. It is certainly appropriate that universities should serve American democracy in the most effective way."

In the *Southern Educational Journal* for November is the first of a series of articles on "Manual Training" by Cyrus Kebr, of Chicago. This first article contains

a poem on the pocketknife, "written many years ago by the Rev. J. Pierpont." It begins with the following:

The Yankee boy, before he's sent to school,
Well knows the mysteries of that magic tool,
The pocketknife. To that his wistful eye
Turns, while he hears his mother's lullaby;
His hoarded cents he gladly gives to get it,
Then leaves no stone unturned till he can whet it;
And in the education of the lad
No little part that implement hath had;
His pocketknife to the young whittler brings
A growing knowledge of material things.

"Manual Training" is the title of an article in the October number of the *Normal Instructor* by E. A. Bending, of Dayton, Ohio. This article is intended for teachers of other subjects. It tells what is meant by manual training and incidentally deplores the fact that so little attention is generally given to the artistic side of manual training work.

BOOKS AND PAMPHLETS.

Studies from the Yale Psychological Laboratory, Volume VI, 1898, edited by Edward W. Scripture, Ph.D. Price, $1.[1] This volume contains (*a*) a color illusion, by Professor George Trumbull Ladd; (*b*) Researches in Cross-Education, by Walter W. Davis; (*c*) Researches in Practice and Habit, by W. Smythe Johnson.

In his "Researches in Cross-Examination," Mr. Davis gives in detail several series of experiments similar to those referred to by Dr. Scripture in his article on "Manual Training and Mental Development" in the October number of the MAGAZINE. The subject is taken up under the following heads: (1) Historical, (2) rapidity of voluntary effort, (3) strength of voluntary effort, (4) accuracy of voluntary effort, (5) diversion of energy, (6) theoretical. The conclusions he arrives at are stated by him in the following words:

a) "The effects of exercise may be transferred to a greater or less degree from the parts practiced to other parts of the body. This transference is greatest to symmetrical and closely-related parts.

b) "There is a close connection between different parts of the muscular system through nervous means. This connection is closer between parts related in function or in position.

c) "Will power and attention are educated by physical training. When developed by any special act they are developed for all other acts."

The object of Mr. Johnson's "Researches in Practice and Habit" was "to ascertain the results of practice on voluntary movements by repeating the same movements an equal number of times each day until approximately the highest degree of perfection attainable was reached." By triangular movements of the hand he demonstrates that "the psychological order of development in voluntary movement is (1) rapidity and (2) regularity." From experiments in drawing circles he shows that "a short exercise often repeated is the best method of practice for rapid development of accurate adjustment of the muscles."

A Primer of Forestry, Part I—The Forest—By Gifford Pinchot. This book sets forth in clear and interesting language the foundation principles of the science of

[1] Dr. Scripture has offered to make a special rate of 50 cents to readers of the MAGAZINE who wish copies of any volume of the "Studies," provided cash accompanies the order.

forestry. It treats first of the trees as individuals, showing how the material obtained by the roots from the ground and by the leaves from the air, is utilized in the growth of the trees. It also treats of the requirements and relations of the trees as they grow side by side in the forest, and of the various enemies of the forests. The book contains eighty-eight pages of reading matter, through which are distributed eighty-three text figures; there are also forty-seven full-page illustrations. It is published as Bulletin 24, Division of Forestry, United States Department of Agriculture. This book will be followed later by *Part II* of the *Primer*, which is to be entitled "Practical Forestry."

The book is surely one of interest to manual-training teachers, and I believe could be used advantageously as a book of reference for students.—C. S. VAN DEUSEN.

American Schools of Mechanical Technology.— Buffalo Forge Company, Buffalo, N. Y. It is not an uncommon thing nowadays for a manufacturing establishment to publish and distribute free of charge books on mechanical subjects of considerable value to teachers. One of the most attractive of the recent publications of this character is *American Schools of Mechanical Technology*, containing more than one hundred full-page half-tone reproductions from photographs and drawings, showing exteriors of technical and manual-training school buildings and interiors of their forge shops. While this book is primarily an advertisement for the Buffalo forge, it is at the same time a valuable book of reference to anyone who is planning a school forge shop.

The Economic Aspect of Manual Training.— A leaflet by L. A. Buchanan, supervisor of manual training in Stockton, California, and secretary of the manual-training department of the National Educational Association. Toward the latter part of this paper Mr. Buchanan gives figures to show that only about 5.8 per cent. of the total number of male children enrolled in elementary schools ever attend high schools. He then asks the question: "What, then, becomes of the 94.2 per cent. that reach the age of sixteen and seventeen years?" This he answers as follows: "We may easily say that more than 90 per cent. of them seek employment of some kind. That is, more than ten millions of boys between the ages of six and eighteen are thrust upon the world in the United States to seek their livelihood during the period from six to eighteen years respectively, or almost a million a year." Manual training should be introduced into our elementary schools, if for no other reason, to help these boys to become more productive members of society.

Circulars of Information.

St. Louis Manual-Training School, Washington, University, St. Louis, Mo. Contains a brief historical statement concerning this, the oldest manual-training high school in America, also a record of its 730 graduates.

Manual Training Department, Hartford Public High School, Hartford, Conn. Outlines of courses, and illustrations showing equipment of the new manual-training building.

Mechanics Institute, Rochester, N. Y. Besides the usual announcements of courses in art, manual training, and domestic science, it contains illustrations of Mr. W. W. Murray's desk top for use in public schools, and of courses of study in (*a*) joinery, (*b*) desk-top work in wood for grammar schools, (*c*) wood-turning, (*d*) pattern making, and (*e*) forging.

MANUAL TRAINING MAGAZINE

APRIL, 1900

THE OUTLOOK FOR MANUAL TRAINING IN SECONDARY SCHOOLS.

CHARLES H. KEYES.
Supervisor of Schools, South District, Hartford, Conn.

THE decade of educational history just drawing to a close has been marked in the United States by a vigorous and persistent effort for the improvement of secondary schools. This activity has resulted in large transformation of the methods of instruction, and the introduction of many new elements into the program of studies. During this period manual training apparently has not received as serious or continuous consideration in the councils of secondary education as have the so-called academic elements of the curriculum.

But in solving the problems and meeting the perplexing questions raised by these traditional elements, we seem to have advanced to a position where the outlook for manual training in the secondary school is more propitious than at any other time since the work was first undertaken. Evidence and explanation of this proposition will appear in the examination of a few facts which it is the purpose of this article to set forth.

1. In no department of high-school instruction has the character of the teaching force shown more marked improvement than in manual training. This has been in part due to a desire to keep pace with improvement in other departments. It has been spurred on by the conviction on the part of principals and superintendents that in no other department of high-school instruction was such improvement so sadly needed. With this has gone a demand that such instruction should be definitely related to a life of culture and power through being administered by a teacher who possessed both. Sharp eye and cunning hand and head full of pedagogical lore are not to be accepted

as substitutes for true culture in the manual-training teacher. This notice has been served, and acknowledgment of service has been made by nearly all high-grade institutions in which the preparation of manual-training teachers is either a specific purpose or an important incident. The result is that only men and women of superior power and skill among their graduates are being advised to become manual-training teachers. A further result of the recognition of the justice and wisdom of this demand is the attraction of college graduates to this work. Young men with liberal education and some successful experience in teaching are adding preparation for this service, and the schools show the effect in a body of instructors that appeal to the best in the student body.

2. High-school manual training has received new impetus from the critical study of systems, and from the rivalry between the disciples of the modified Swedish and Russian schools. There was much that was hopeless in the preceding decade, when the Russian system and models held almost absolute sway in the high schools. There was more of discouragement wherever elementary sloyd was substituted as ideal instruction in manual training for pupils of high school age. The contest and bebate between men who knew intimately but one or the other system and seemed thoroughly content to laud the familiar and decry the other, did much to mystify and annoy the citizen and the school committee beginning to look into the merits of manual training. It also did much to hamper the progress of manual training in all schools. Within a hundred miles of Boston, the great sloyd center, there were cities to whose manual-training teachers, sloyd was an unspoken quantity. Within a hundred miles of Philadelphia, a center for the modified Russian system, there were cities in whose schools nothing but sloyd was known. Happily that condition is rapidly passing. Would that it might truthfully be said to have entirely passed! The newer additions to the teaching ranks have made comparative studies, and grasped the possibility of combining meritorious elements without regard to origin. Further, progressive high-school principals and wide-awake superintendents have sufficiently familiarized themselves with the cardinal features of manual training, no longer to be compelled to take work on faith or on the approval of a teacher whose experience and training has been but narrow. We have reached the point where among broad-minded teachers of manual training and high-school principals, there can be some reasonable agreement as to the character of a suitable course for high schools. This essential agreement is one of the most cheerful features of the outlook.

3. Additional ground for encouragement is found in the fact that even the people who still think of the high school as only a college preparatory school, have come not only to tolerate but to respect the manual-training work. This respect manifests itself in permitting the manual training to count fairly toward completing the course and earning the high-school diploma. Intelligent school committees and principals see the absurdity of providing work which is not worthy of recognition when well done. Honestly insisting that neither time nor money should be spent on instruction which was not worth counting, they have simply asked, is manual training worth while in the high school? If not, put it out. If it is, give it full credit towards earning the high-school diploma. There was no room for avoiding one or the other conclusion and its accompanying duty. When brought face to face with the practical question, it has been met in the only way possible while maintaining respect for one's own honesty and intelligence. True, an occasional body of doctrinaires not called upon to practically teach or administer manual training in the high school, have, in considering the content of high-school courses, promulgated the gospel that a certain amount of elocution, Delsarte, and manual training, ought to be thrown in but not counted. These people have taken themselves seriously, but no one else has. The major practice, and it is rapidly becoming universal, is to give the manual training full credit toward earning the diploma of graduation.

4. The position of manual training in the high schools today is much strengthened by the recognition of their work by the technical schools. The acceptance for admission by these colleges of the high-school work in mechanical and freehand drawing, and that in joinery and turning on the same basis as mathematics and English, or French and physics, has done much to secure popular appreciation of the work and to improve its teaching. The value of this recognition and endorsement from above will be best understood when we notice its effect on the work of a school in which, for example, there are courses in joinery, in pattern making, in forging, and in machine-shop practice. The institute of technology accredits and tests the first but not the other three. Almost immediately increased thoroughness and earnestness marks the teaching of the first course. A little later the pattern making is put among the list of accepted subjects for admission to the technical school and straightway the teaching of this course is strengthened and improved. To this general recognition and acceptance by the technical schools we owe much of our marked improvement

in high-school manual training. It may be said in passing that we are earning this recognition too, without indulging the mistake of giving the boys the identical models and exercises prescribed in the technical school. The test from above has usually been one of power, not, has he taken our course in drawing, joinery, and turning? But can he make and read a working drawing and a blue print? Has he a reasonable elementary mastery of the tools, machines, processes, and materials of the joinery and turning shop? The extension of this practice to the manual-training work of the whole four years of the high school seems to be the next step and promises well for the upper and the lower schools alike.

5. The future of manual training is further assured by the practice of a number of scientific schools which without a formal advance-pledge to do so, are giving credit in their own courses for manual training done in the high school. When their curriculum prescribes a course in mechanical drawing or joinery or lathe work and they find among the students pursuing this curriculum a boy who through having made his preparation in a high school furnishing first-class manual training, is already proficient in such work, they simply refrain from teaching him what he already knows. The fact that work done in his high school without retarding by a single month the completion of his preparation for entrance to the technical school, is received as the equivalent of a full year's course in the college draughting room or joinery or pattern-making shop, gives every one added respect for and confidence in the value of the high-school training. Not only is this a great gain for the high school, but it is a great advantage for the technical and scientific school as well. It enables the higher school to devote the time thus gained to more and higher work in pure and applied science or mathematics. That at least one half of the shop-work and drawing of the technical school can be fully as well done in the high school has been proven over and over again. The disposition of the higher school is to permit it to count, only reserving to itself the right to test the thoroughness of the work. That such test of efficiency and endorsement of merit is now available for high-school manual training and that it is accepted as unquestionable evidence of value, just as the successful passing of the Harvard or Yale classical examinations is received as evidence of the value of the high-school Latin teaching, is a most promising feature of the outlook for manual training today.

6. But an element of even greater good omen is found in the recognition manual training has won in the high schools in old conservative classical centers. The success of the movement in cities like Chicago, St. Louis, St. Paul, Kansas City, and Denver has meant a great deal. The influence of their example has reached hundreds of communities. But these have not been the names to conjure with in the fields of greatest opposition, in the communities where the short-sighted friends of classical education looked with resentment and contempt upon the introduction of manual training, in towns where the value of good classical teaching has been proven, and where it was feared that any innovation meant a cheapening of the ideal of secondary education. But the great success of high-school manual training in cities like Cambridge, New Haven, Hartford, and Providence has robbed opposition of its greatest power. The success not only of special manual-training high schools in such cities but the eminent success of manual training as a department of general high-school instruction makes success everywhere more certain. It prepares the way for the enactment in other states of laws like that of Massachusetts, by which every community of more than 20,000 people is required to make provision for manual training in its high school.

7. But the largest opportunity for manual training has been made through the definite stand in favor of election in high-school courses now being taken throughout the country. The report of the Committee on College Entrance Requirements adopted by the National Council of Education at its last session, has done much and will do more to crystallize this sentiment. With the adoption of the essential features of this report as the policy of secondary schools, manual training will succeed on its merits. It will stand on the same plane of vantage as other subjects of instruction. It will appear that thorough work in manual training can become a part of many courses which do not neglect the traditional academic elements. And right here is one of the chief difficulties in the minds of many who have come to recognize the educational value of manual training, but who do not see a way to do this work and still give sufficient training in the five academic fields which have traditionally occupied the high-school pupil. That a high-school course is possible which for its manual training shall offer four years work of five hours per week in drawing, and four years work of ten hours per week in shop; and for its prepared work five hours per week each year in each of three academic subjects, ought to be readily seen by anyone who takes the time to look into the

matter. The variations of academic work possible may be shown in a table taken from the actual experience of a successful secondary school in which in addition to the amount of manual training named above, provision was made for four years instruction in English, mathematics, languages (Latin, French, German), history, and science (physics, chemistry, biology, and physiography). Pupils were required to take no less than two years work in each of these five departments. The following table shows the fifteen most common elections for completion of the course.

TABLE I.

Choice	English	Mathematics	Latin, French, or Grammar	Natural Science	History
No. 1	2 years	4 years	2 years	2 years	2 years
No. 2	2 "	3 "	2 "	3 "	2 "
No. 3	2 "	3 "	3 "	2 "	2 "
No. 4	2 "	3 "	2 "	2 "	3 "
No. 5	3 "	3 "	2 "	2 "	2 "
No. 6	3 "	2 "	3 "	2 "	2 "
No. 7	3 "	2 "	2 "	3 "	2 "
No. 8	3 "	2 "	2 "	2 "	3 "
No. 9	4 "	2 "	2 "	2 "	2 "
No. 10	2 "	2 "	3 "	3 "	2 "
No. 11	2 "	2 "	3 "	2 "	3 "
No. 12	2 "	2 "	4 "	2 "	2 "
No. 13	2 "	2 "	2 "	3 "	3 "
No. 14	2 "	2 "	2 "	4 "	2 "
No. 15	2 "	2 "	2 "	2 "	4 "

Pupils were also allowed to omit one year of shopwork and substitute an additional year's work in any of the five academic lines. In some cases pupils preparing for special schools or colleges were allowed to omit one year's work in both drawing and shop, substitute two years of academic work, and make other approved interchange of subjects to meet the requirements of the special institution they sought to enter. Nearly all this last class of students elected to take, along with their three years of drawing and shopwork, some one of the seven combinations shown in the following table:

TABLE II.

Choice	English	Mathematics	Latin	French	German	Natural Science	History
No. 1	3 years	2 years	4 years	2 years	—	1 years	2 years
No. 2	3 "	2 "	4 "	2 "	—	2 "	1 "
No. 3	3 "	2 "	4 "	—	2 years	1 "	2 "
No. 4	3 "	2 "	4 "	—	2 "	2 "	1 "
No. 5	3 "	2 "	4 "	3 years	—	1 "	1 "
No. 6	3 "	2 "	4 "	—	3 years	1 "	1 "
No. 7	2 "	3 "	4 "	3 years	3 "	1 "	2 "

Of course this is but one of the many solutions of the problem when the possibility of election of subjects is recognized, as it seems likely to be quite widely.

The outlook then for manual training in the secondary schools of the United States today, is certainly brightened by the availability for service of a better trained body of teachers, by the more critical, but increasingly generous comparative study of systems, by the disposition of high-school managers to give to the manual-training work full credit toward graduation through the recognition of the work by schools of technology, through its acceptance by scientific schools, through the recognition which the work has won in classical centers, and through the larger opportunity which the more general adoption of the elective policy assures. No effort must be spared by the friends of manual training to take full advantage of the increased opportunity.

THE MANUAL ELEMENT IN THE SCHOOLS OF GERMANY.

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TO TEACH the child to observe — to judge ; — to grasp subjects, first in the concrete and finally in the abstract ; to be honest, accurate, and precise ; to use reason and method at all times and under all conditions ; to plan and create, and, in fact, to *think* and to *do* — these are some of the problems confronting the teacher of today and with which modern education has to deal.

Is the school of the present taking too much upon itself ? Is it demanding so much of the boy and girl that only a finished surface is the result, while the framework is weak and short-lived ? Is the school operated as an intellectual mill, where thought, not action — principle, not application — are watchwords ? These are some of the questions which thinking men and women are asking.

Those who have claimed much for educational hand-work in the school, are recording with satisfaction the results, as they are each day becoming more apparent.

To the student of this subject there is no more attractive field for study than that afforded by the schools of Germany — a country conservative in its educational policy ; where foundations are deep rooted and firm, and where close thinking and the spirit of investigation largely prevail.

In Germany, as perhaps in no other country, can one see such a variety in hand-work in schools, especially among pupils of primary grade. From the kindergarten to the gymnasium the student's thought is finding expression in the clay which takes form in his hands, or is being carved in the wood before him. With brush and color he tells truths that could be so well told in no other way, or with less force and vaguer meaning, and his pencil discovers to him secrets before unrevealed. Paper and cardboard he makes over into forms and shapes of which the imagination hardly dreamed, while lessons in harmony of color and beauty of design are unconsciously learned. He saws and planes his ideas into shape at the bench, and his brain and hammer make for him from the crude iron, such wonderful pieces of mechanism as to call up in himself feelings of just pride in his creation.

To trace the development of manual training in Germany would be to occupy more space than is at the disposal of this paper. It is not strange, however, that amongst a people who place so much weight on the utterances of Martin Luther as do the Germans, that his suggestions should receive the attention they deserve. Indeed, the wonder is that his ideas did not take a definite shape much earlier in the educational history of the country than they did.

But while Luther was almost without open supporters in his then erratic views as to the trend education should take, there were those, among them Francke, who, some three quarters of a century later, spoke strongly in favor of a utilitarian element in schools. He, however, in common with Luther, while advocating the learning of a trade on the part of the boy, saw deeper than the mere executing of the object — the tangible product — and hints at results to be looked for *in* the boy himself; in other words, the effect of the work upon the worker.

"The purpose of the exercise," said Francke, "is not the production of a large number of objects, but to give the pupil knowledge and motion."

Nor can we deny that the thoughts of those men outside of Germany, notably Rousseau in France, and Locke in England, who were working out problems far in advance of their times, had an influence on the future condition of the schools. It is, however, to Pestalozzi, the originator of means and methods, and to Froebel, the organizer, that Germany and the world are chiefly indebted for laying the foundation of a system that should enable the child to give expression to and through his activities.

Germany has all along more and more realized the force of Froebel's words: "Man only knows thoroughly that which he is able to produce." It also realizes that manual training to fulfill its fullest function, must begin with the kindergarten and be continued through the university.

For more than two centuries, then, the movement has been a forward one, but most noticeable during the past three or four decades.

Perhaps the one thing above all others that has during the last few years given such an impetus to the manual-training movement throughout Germany, is the Deutscher Verein für Knaben handarbeit. This association in 1887 founded in Leipzig, a manual-training college, where men and women might fit or perfect themselves in the various phases of hand-work carried on in the volksschule. Most fortunate

indeed was it that such a man as Dr. Woldemar Götze was secured to act in the capacity of director of the college. He was succeeded, on his death, by Dr. A. Pabst. Under his able guidance, courses are offered in kindergarten work, or preparatory grade of manual training; clay and plasteline modeling; cardboard work; chip carving; gardening, and fruit tree cultivation; glass work (for the construction of simple physical apparatus); two kinds of woodwork—the ordinary bench work and a form suitable for country purposes and of a rough character; also metal work, adapted to the regular school and to the needs of country districts—the latter including many bent-iron processes. These courses are so arranged that teachers in the various districts, may, if they desire, attend some one or more of them. Credit is given for all work done and a diploma granted on the satisfactory completion of any course. In addition to the hand-work there are lectures on the philosophy of manual training; its pedagogical and psychological bearings; methods of presenting subjects; courses of instruction and the relation of manual work to the traditional book work. Beside this, the students of the various courses, in company with the director, visit the schools and educational institutions of Leipzig and of the surrounding towns. In this way are the students placed in touch with the activities and interests of others, and their ideas broadened.

Seminars are held at frequent intervals. Here points of criticism —favorable or adverse—on what has been observed; on methods in use in the schools; on the place hand-work should occupy in the curriculum, in relation to the other studies; these points and many others are brought out.

While the work done by the students in the Manual Training College is of a high grade and the training thorough, the fact is a significant one that the instructors are not in all cases teachers, but are drawn from the ranks of the mechanic or artisan, being masters in their respective callings. It is claimed by those in authority that the same principles do not govern the selection of an instructor in the training colleges as in the volksschule. In the former it is the *teacher* who is to be taught a new subject, and the one to present such subject, must, say they, be an expert, more particularly in the manipulation of the tool than in a knowledge of the child, or of principles governing the presentation of subjects. However good the results may be, it is questionable whether they might not prove still better, were it possible to secure the teacher artisan. In fact, where we find the latter

condition existing in the college, we find the teaching much more efficient.

In the volksschule the manual instructors are, in most instances, trained teachers. They are men and women who know, first of all, how to present subjects in the light of education and deal with children, and it is in large measure owing to this fact that such progress has been made on the manual side.

The system of educative hand-work is probably developed in the schools of Saxony more fully than in any other of the German kingdoms. In all of the cities and in most of the towns and country schools, much attention is given the subject. But while we observe the progress being made by primary pupils in modeling natural forms; in painting birds, leaves, flowers, and fruits; in making beautiful and useful articles from cardboard, and in the executing of geometrical designs by means of chip-carving, one cannot but see many inconsistencies running through it all. Not only did the Germany of two hundred years ago, but the Germany of today as well, in matters educational, leads the world in theory; and this is true of manual training, notwithstanding the fact that institutions and customs are fixed and the people conservative. And herein lies one of the inconsistencies spoken of—practice and theory do not dovetail. The German school men themselves fail in large measure to put into actual practice those methods which they recognize as being rational, in the manual room or shop. Here one may see the clay being molded over a solid form instead of being shaped by the hands only, while tests for measurement are made, not with the eye but with some mechanical device, while there the circle is being drawn by passing the circumference through a series of points placed at equal distance from a central point, cramped and unnatural movements being substituted for free ones. The manual lesson, of which the boy has two per week and of one and one-half hour's length, each, is in some schools divided, the first half-hour being devoted to explanations of tools, processes, and manner of executing the work in hand. It frequently happens that the explanations are so long and tedious that the pupils are not able to give proper attention to them; interest is lacking. The work at the bench appeals to them, and their only thought is for it. Very little of what has been said by the teacher is retained by the child, and even if the reverse be true, the pupil goes to his work having had pointed out to him the difficulties he should meet and overcome. He is thus weakened for his future attempts in this line and led to lose respect for his work and confidence in himself.

The manual room, which should be, of all rooms, well lighted and ventilated, is frequently found not to fill these requirements. The lighting is poor, and fresh air seldom enters the room except with the opening of the door.

Pupils from nine to thirteen years of age in most schools work extensively with cardboard and chip-carving. Hardly a school anywhere but devotes more or less time to these materials. There is not so much cause to wonder at the amount of such work done in schools when the propensity for it is noticed elsewhere. Furniture, ceilings, door-posts, railings, bric-a-brac, all are decorated or over-decorated. In the school every model is carved in geometrical designs until hardly an uncovered spot is left upon it. Many of the designs are attractive and, if used legitimately, have an artistic side, while patience and care are required in their execution. There is, however, much repetition and practically no flow of curve so restful to the eye. The work is of so minute a character that it is very trying on the eyesight. The number of cases of defective eyesight among pupils in the schools of Germany materially increases between the ages of six and sixteen, and there seems no room to doubt that much fine work in carving, and done under conditions not the most favorable, is in no small measure responsible for this. Then again, free movements of the body, so much to be desired in the growing child, are not given by this semi-passive work at the table, the fore-arms and fingers only being to any extent brought into play.

One of the leading exponents of educative handwork in Germany declares that if he had the power to modify the now existing system, he would in no manner disturb the courses in wood and iron, but would change in many respects the cardboard work, and eliminate from the school altogether much of the chip-carving as now done.

It is claimed by school men in justification of these courses, that much less equipment is needed to carry on work of a light character than would be necessary to do bench work of a heavier grade, and it were better to do this than to do none. If not carried too far, the lighter work certainly has value educationally.

One of the most pleasing features noticeable as characterizing the manual occupations in Germany, is the close connection made between the shop and the traditional work. Much progress has already been made in a rational connection of subjects, a correlation of the so-called mental and manual not only, but of book subject with book subject. Indeed between handwork and the natural sciences, the connection is

so close that to subtract the former would be to seriously handicap the latter. Pupils of primary grade make their own apparatus, to be used in illustrating principles in physics, chemistry, meteorology, etc., every laboratory being liberally supplied with simple and useful devices. Mathematics, too, takes on for the student a new meaning when viewed through the light of manual training. Here the shop-work is given equal credit with the book lines, and the teacher of shop must have the training required of other teachers, and is respected as are they.

The girls are sometimes neglected in the German scheme. While in some places they are allowed to take the less heroic lines of work, and here and there sewing and cooking are made part of their courses of study, much less attention is paid their needs from the manual or motor side than should be.

Very few teachers of manual subjects, even in primary grades, are women. The idea seems to generally prevail that for handwork of whatever nature, men rather than women can best fill the positions.

The neglected side of manual training in Germany, as in America, is the art side. The artistic in decoration is aimed at, while form and proportion of models do not in many cases please the eye. In the heavier forms of handwork particularly, the articles are made with chief reference to their utilitarian value — the purpose they may serve in the home. But with this is not coupled the idea that the artistic sense should at the same time be cultivated. The thought that beautifying the home elevates morally and intellectually the lives of the people, is a lesson yet to be learned by Germany as well as by our own country.

It is a notable fact as illustrative of the high place that handwork occupies in the very heart of the German people, that every prince of the royal house — not only the present reigning family — is supposed to learn at least one handicraft, while in some instances the individual is familiar, with the elements at least, of several crafts.

The connection between shopwork and the industrial life of the people is indeed very close, and while the hand-work in schools is of a formative nature, its relation to the various arts and industries is never lost sight of. In a country where so much depends upon the earning power of the individual as in Germany, and where the son is so likely to follow the occupation of the father, this feature is of more vital importance than with us in America.

The average German student, earnest at all times, loses never a moment of his shop lesson. No disciplining is necessary. Hardly ever has a pupil time to look up from his work or to speak to his fellow. And what a part are these lessons learned in the manual-training room to play in the future of Germany! Lessons of patience, exactness, and order will be applied in later life. The student learns to have sympathy for his neighbor and forgets that differences in rank and position exist. He is prompted to occupy in life a position that before seemed to him a degraded one, or he is inspired to advance himself until capable of occupying a higher sphere than that occupied by his forefathers. The school has for him a new meaning and helps him to live a life fuller, sweeter, and nobler than he could have lived without it.

OUTLINE OF A COURSE IN PATTERN MAKING.

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THE principles which govern the laying out of a course in pattern making, or any other course in manual training, are the same which are applied to academic courses of study. From the known to the related unknown, from concrete to abstract, from empirical to rational, from simple to complex, from particular to general and return — these are common to all courses, and to these might be added "Learn to do by doing;" also the truth contained in the saying, "A man without a purpose is like a ship without a rudder, bound for the Port of Nowhere."

In planning any course of study, both its general aim and its specific purpose should be determined and kept in mind. The general aim of a course in pattern making should be to teach *Truth* — to train pupils in habits of observation, accurate thinking, close application, thus enabling them to reach true conclusions from carefully discriminated data. The specific purpose of such a course should be to teach pupils to make representative types of patterns from which castings can be made — to teach principles which underlie good construction; to acquaint pupils with some, at least, of the terms and practices of the machine shop; to familiarize pupils with the operations and practices of brass and iron foundries, and with the properties of metal from which castings are made.

Pattern making is so closely related to molding that one branch cannot be well taught without the other as an accompanying study. If these two branches are taught together, we then arouse a lively interest in the pupil, and through this interest save much valuable time.

In attempting to outline a course in pattern making I shall endeavor to embody the principles already referred to, and arrange the work in groups, each group to set forth an important step, or principle, in both pattern making and molding.

PATTERN MAKING.	MOLDING.
GROUP I.	
Principles.— Draft and shrinkage.	Principles.— Care in packing flask.
Models.— Ribbed pattern.	Set runner.
Shoe.	Gate-cutting.
Ring (supplementary).	Venting.
Eyebolt (supplementary).	Models.— Ribbed pattern.
	Shoe.

GROUP II.

Principle.— Finish.
Models.— Face-plate.
Cone-pulley.
Hand-wheel (supplementary).

Principles.— Further practice of first principles.
Coping out in nowel.
Models.— Face-plate.
Cone-pulley,
Ring.
Hand-wheel.
Eyebolt.

GROUP III.

Principle.— Simple coring.
Models.— Gland.
Crank.

Principle.— Setting vertical core.
Models.— Gland.
Crank.

GROUP IV.

Principle.— Simple split patterns.
Models.— Sheave-pulley.
Jack.
Cap-nut (supplementary).

Principles.— Green sand core.
Three-part mold.
Balancing cores.
Models.— Sheave-pulley.
Jack.
Cap-nut.

GROUP V.

Principle.— Split patterns involving construction.
Models.— Return bend.
Tee pipe.
Elbow (supplementary).

Principle.— Set Cores with chaplets.
Models.— Return bend.
Elbow.

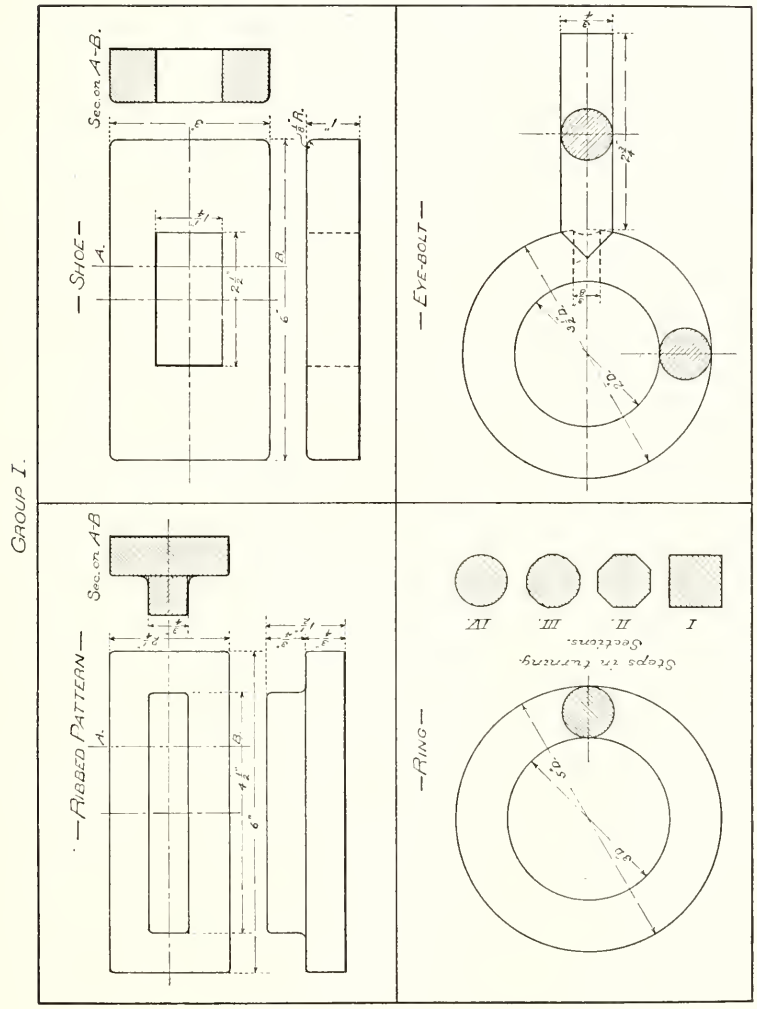
GROUP VI.

Principle.— Building up.
Models.— Pulley.
Pillow block.

Principle.— Stop-off prints.
Model.— Pillow block.

GROUP VII.

This group of work may include a complete set of patterns for some simple machine, the construction of which may be worked out later in the machine shop. If time permits, this group may represent individual projects; if not, it may be a class project. While the individual project may call for special effort from the teacher, it is by far the most beneficial to the pupil.


GROUP I.
— SHOE —
SECTION A-B.
— EYE-BOLT —
— RIBBED PATTERN —
SECTION A-B
— RING —
Steps in turning.
Sections.
I
II
III
IV

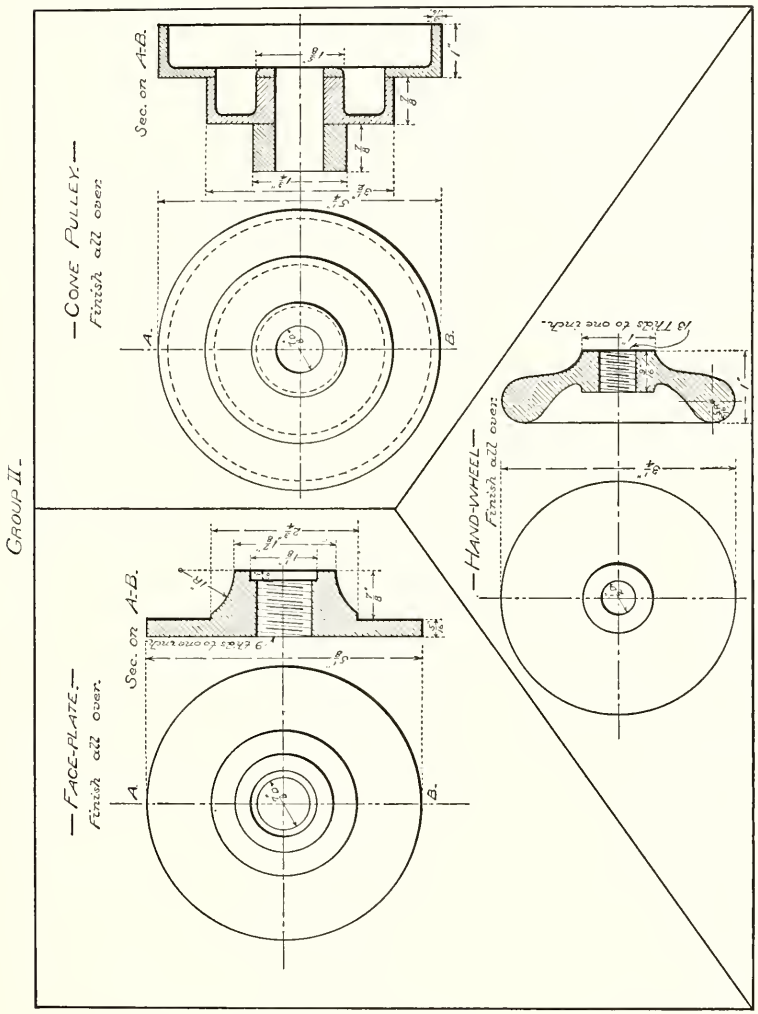
PREPARING AND TEACHING THE GROUPS.

GROUP I.

1. Give brief history of pattern making.
   (1) In ages far remote men made tools and contrivances of bronze, which, being an alloy, must have involved the casting of metal, and hence the use of patterns.
   (2) During the early part of the present century patterns, castings, and the finishing of the machine in the machine shop were done by the same man.
   (3) With the age of iron came separate trades.
2. Show how to select stock suitable for the work.
   (1) The following may be considered:
      (*a*) Its tendency to warp.
      (*b*) Its tendency to bend.
      (*c*) Its tendency to swell and shrink.
   (2) Kinds of wood.
      (*a*) White pine (especially good for large patterns).
      (*b*) Mahogany (best wood, by far).
      (*c*) Cherry.
3. Consider general principles in construction.
   (1) Shape of pattern depends upon strength of material from which the casting is to be made.
   (2) Strength of pattern itself.
      (*a*) Consider stove patterns.

      NOTE.—In stove patterns two shrinkages are allowed, thus enabling one to make a regular pattern from the first good iron casting obtained from the original wooden pattern.

   (3) The desirability of the pattern molding well.
4. Show why draft is necessary.
   (1) Amount required.
      (*a*) General rule, $\frac{1}{8}''$ to 12″.
5. Consider shrinkage of metals.
   (1) Cast-iron, $\frac{1}{8}''$ to 12″.
   (2) Brass, $\frac{3}{16}''$ to 12″.
   (3) Lead, $\frac{1}{4}''$ to 12″.
6. Show the advantages of the shrink rule.
   (1) Its use saves time.
   (2) It insures accuracy, which could not possibly be obtained with the standard rule.
7. Consider fillets.
   (1) Made of wood and carried in stock.
   (2) Beeswax is used in small work.
   (3) Putty is sometimes used on rough work.
8. Why sharp corners should be removed.
   (1) Pattern looks much better.
   (2) Better castings are obtained.


GROUP II.
— FACE-PLATE. —
Finish all over.
Sec. on A-B.
A
B
— CONE PULLEY. —
Finish all over
Sec. on A-B.
A
B
— HAND-WHEEL —
Finish all over.
To Trace to one inch.

GROUP II.

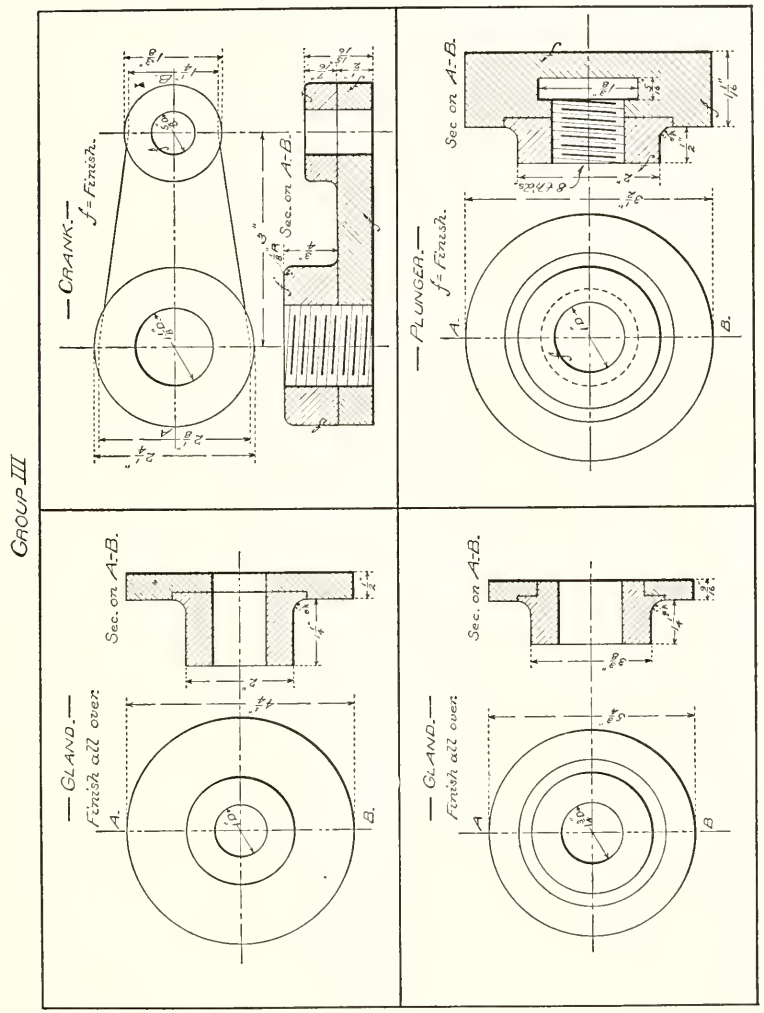
1. Make clear what is meant by "finish," and show what governs the amount.
   (1) For ordinary, small patterns $\frac{1}{16}''$ should be allowed, over and above the finished dimensions; that amount to be removed in the machine shop.
   (2) On large castings the surface is liable to become rough and uneven; therefore a greater amount should be allowed.
2. Consider the use of varnish.
   (1) Its object.
      (*a*) It prevents the moisture in the foundry sand from penetrating the wood and causing the pattern to loose its shape.
      (*b*) It makes a smooth and glossy finish on the pattern, and thus facilitates its withdrawal from the sand.
      (*c*) Varnished patterns escape much rough usage, commonly bestowed by molders.
   (2) Its properties.
      (*a*) Orange shellac varnish is made by dissolving orange shellac in alcohol.
      (*b*) Black shellac varnish is made by adding dry ivory black, or lampblack, to the orange shellac varnish.
   (3) Its application.
      (*a*) Apply three or four coats with brush, and sandpaper between each coat, giving special attention to the first coat.
      (*b*) Use clear varnish for pattern, black for core prints and inside of core boxes.
      (*c*) Varnish when day is clear. When air is damp the varnish assumes a soapy, milky appearance.

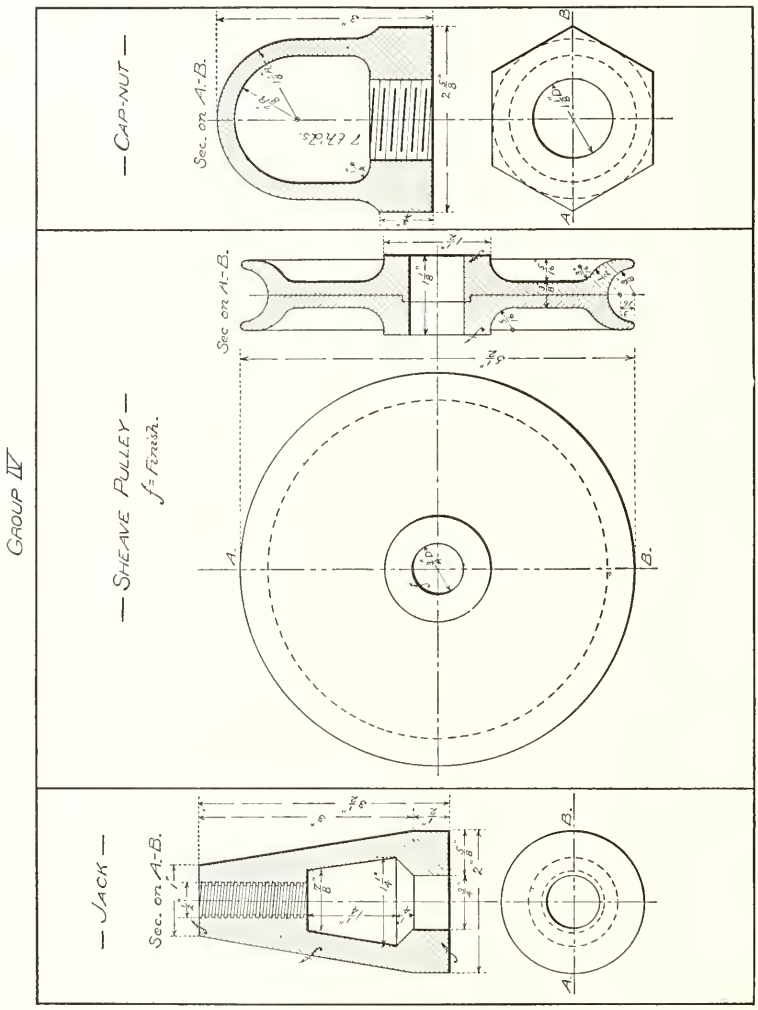
GROUP III.

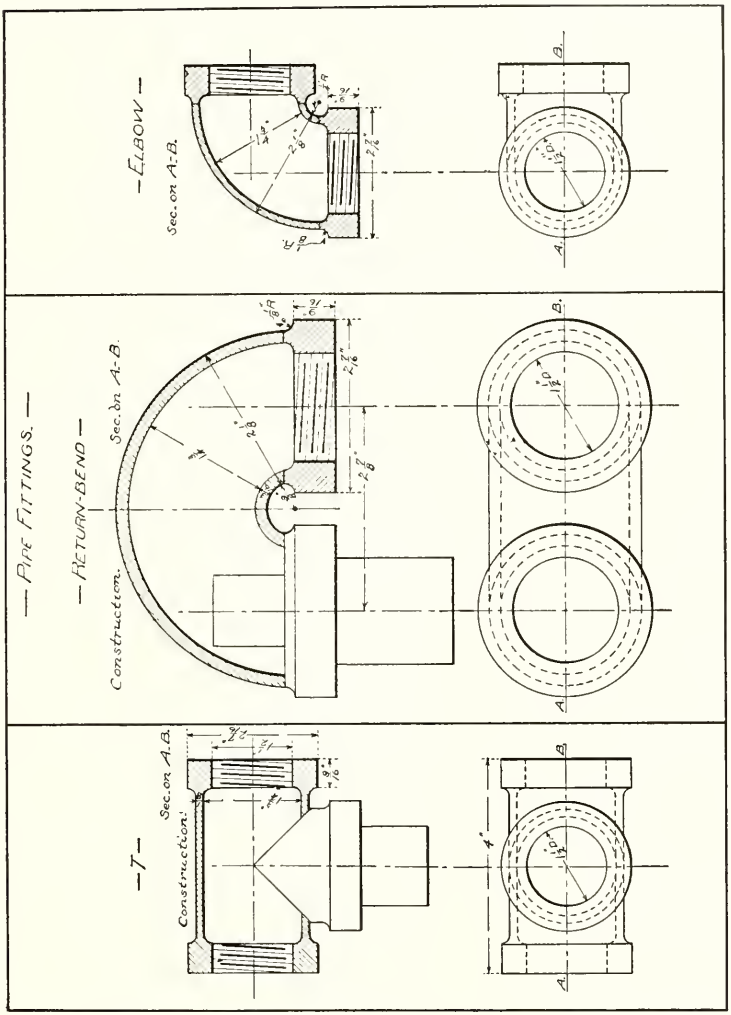
1. Consider the advantage of cores.
   (1) By the use of cores one is enabled to make chambers or holes in a casting where they could not be made in the pattern itself, because of difficulties in molding. Ordinarily no regular hole less than 1″ in diameter should be cored.
2. Show how the size and shape of holes govern the construction of patterns.
   (1) A hole no deeper than its diameter should be formed by a green-sand core.
   (2) Patterns where the hole is not longer than four times its diameter may be constructed so as to place core in a vertical position.
   (3) Patterns where the hole is longer than four times its diameter should be constructed as a split pattern, and core placed in a horizontal position.

GROUP IV.

1. Show why it is necessary to split patterns.
   (1) They are much easier to mold.
   (2) Much smoother and better results are obtained in the foundry.
2. Consider the manner of holding the halves together while turning.
   (1) For small pieces use glue at ends, with two thicknesses of paper between the two pieces, so that they may separate easily when finished.
   (2) For large pieces use iron dogs or center-plates.


GROUP III
— CRANK. —
f= Finish.
Sec. on A-B.
— PLUNGER. —
f= Finish.
Sec. on A-B.
— GLAND. —
Finish all over.
Sec. on A-B.
— GLAND. —
Finish all over.
Sec. on A-B.


GROUP IV
— JACK —
Sec. on A-B.
— SHEAVE PULLEY —
f = finish.
Sec. on A-B.
— CAP-NUT —
Sec. on A-B.
A
B


GROUP V.
— PIPE FITTINGS. —
— RETURN-BEND —
Construction.
Sec. on A-B.
— ELBOW —
Sec. on A-B.
— T —
Construction.
Sec. on A-B.

3. Show the value of dowels and how they are used to hold the halves of pattern in place.
   (1) Wood dowels are very good.
   (2) Metal dowels are superior.
      (*a*) They are more accurate.
      (*b*) They are more durable.
4. Show how to locate dowels.
   (1) In straight work use center lines.
   (2) In irregular work use small wire nails.

GROUP V.

1. Make a study of complicated coring and illustrate by showing several models or parts of a machine.
   (1) Consider how to balance cores.
      (*a*) The length of core-print must be sufficient to balance the core properly.
2. Show that on large patterns rapping plates, made of malleable iron, are used with a lifting screw.
3. Show the principle upon which the core-box plane works.
   (1) Every triangle inscribed in a semicircle, having the diameter of the circle as one side, form a right angle opposite that side.

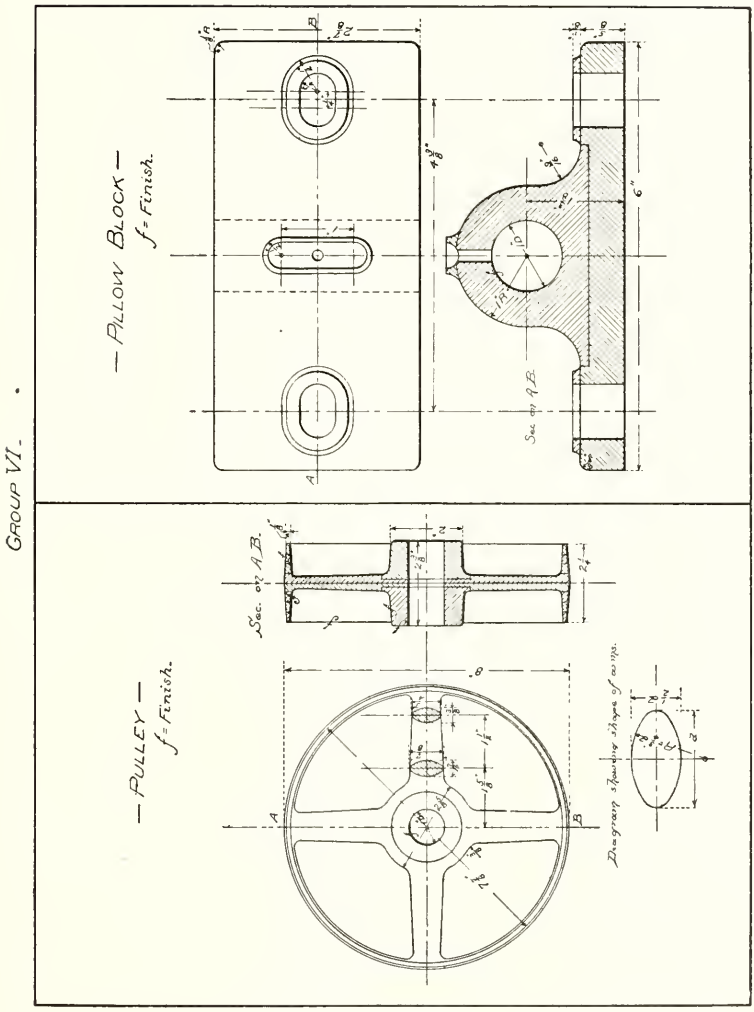
GROUP VI.

1. Study the construction of pulleys.
   (1) Pulleys under 5″ in diameter make with a solid web.
   (2) Pulleys over 5″ and under 10″ in diameter construct with four arms.
      (*a*) Arms may be butted and tied together by the hub.
      (*b*) Where hub is not used tie the arms together by fitting in a little piece of hard wood, which may serve as a feather.
   (3) Over 10″ and under 15″ six arms should be used, as in case (2).
   (4) Larger pulley should have arms lapped.
      (*a*) Show examples either by sketches or by objects themselves.
2. Show how to construct wooden chucks or face-plates.
   (1) For work less than 10″ in diameter solid wood may be used.
   (2) Over 10″ and under 15″ solid wood with battens across the back may be used.

   NOTE.— The centrifugal force due to high velocity is likely to split the chuck, and therefore the grain of the work should be placed across the grain of the chuck in cases where it is practicable.
3. Chucks larger than the above should be built up of segments and screwed to the battens which may form the back.

GROUP VII.

As suggested in previous note, the student should be encouraged to work up small projects and make patterns for himself under the supervision of the teacher. Patterns for a small electric motor or a water wheel may be good at this stage of the work.


GROUP VI.
— PULLEY —
f = Finish.
— PILLOW BLOCK —
f = Finish.
Sec. of A.B.
Sec. of A.B.
Diagram showing shape of arms.

ASSOCIATIONS

THE NEW YORK ASSOCIATION OF SEWING SCHOOLS.

THE spirit of growth and freedom which has worked a change almost magical in the educational world, has had a no less potent influence in the teaching of sewing than in other branches of study. The history of the New York Association of Sewing Schools, therefore, may be of interest to those who have not come in touch with its work during the past seven years.

In April 1893 (in response to a circular issued by a committee representing the College for the Training of Teachers, now Teachers' College, Columbia University, the Stanton Street Mission, now the Pro-Cathedral, Emmanuel Chapel, St. Thomas' Chapel, and the Church of the Holy Communion) a conference of sewing school workers was held in New York which demonstrated the need of a permanent organization to bring together the various agencies for the teaching of sewing. In consequence, the New York Association of Sewing Schools was formed in the autumn of 1893, which, according to the second article of its constitution, was "to act as a center of information for sewing schools, and to formulate and carry out such plans and arrange for such meetings and classes as might be deemed advisable for the further devolopment of its work." During the seven years of its existence the association has fully carried out the spirit of a motion made at its organization that it be "non-sectarian, and that it should not represent any particular system of sewing." Any school or association that teaches sewing may become a member by the annual payment of one dollar, and at present technical schools, training schools, institutions for the blind and for the feeble-minded, church and mission schools, and the public schools of twelve cities are included in its membership. It is represented in the following states: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Ohio, Indiana, Illinois, Missouri, and Colorado.

OBJECT OF ASSOCIATION.

It is the object of the association to put within the reach of its members information concerning new theories and methods, and to enable them to study these by means of conferences, classes, exhibitions, and whatever other agencies may best serve the purpose. The Literature Committee have received orders from many sections of the United States, as well as from Canada, for the leaflets and for the bibliography of the teaching of sewing, which have been prepared for the use of schools.

In May 1895 an exhibition of sewing was held at the Hotel Waldorf, which included not only a most interesting collection of work done in the schools and representative institutions of the United States, but also specimens from schools of France, Germany, Switzerland, Holland, Belgium, and England. This created such widespread interest that it was determined that in the spring of 1897 a larger and more complete exhibition should be held. Through the Department of State at Washington the diplomatic and consular representatives of the United States in Europe were

requested to invite the governments to which they were accredited to participate in the exhibition, and exhibits were sent from thirty-one schools under the direction of the School Board for London; from the public schools of Geneva and Zurich, Switzerland; the public schools of Stockholm, Sweden; the professional schools of Brussels and Ghent; the government schools of Honolulu, Hawaii, and those of Japan. Russia, Italy, and Austria-Hungary regretted that owing to insufficient time and too great distance they could not coöperate, and China declined owing to the fact that no public schools existed for girls. The laws of the United States not having provided for the admission of sewing as an educational factor, application was made to Congress to have the collections admitted free of duty, and on January 27, 1897, Mr. John Murray Mitchell introduced the following joint resolution:

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled —

"That all articles of needlework, and similar articles which have been made by pupils in the schools of Europe, which have been or shall be imported from Europe for the purpose of exhibition by said New York Association of Sewing Schools, shall be admitted free of payment of duty, custom's fees, or charges." This was passed and signed by the President.

The exhibition was opened on Tuesday, March 23, and closed on Tuesday March 30, and it was estimated that it was attended by five thousand visitors. On Friday afternoon, March 28, an informal conference was held and papers were read on "Sewing in Church Schools and Institutions," by Miss Jessie Patterson, first directress of the Industrial School of the Church of the Holy Communion, New York; "Sewing in Public Schools," by Mrs. A. L. Jessup, supervisor of sewing in the public schools of Manhattan and the Bronx, New York City; and on "Sewing in Training and Technical Schools," by Miss H. S. Sackett, director of the Department of Domestic Art, Pratt Institute, Brooklyn, N. Y. The papers were followed by discussion, and by an address from Mrs. Woolman, of Teachers College, New York, on "Child-Study" and on the necessity for greater psychological training of teachers.

FOREIGN COLLECTION BECOMES PROPERTY OF ASSOCIATION.

The foreign collection of exhibits having — thanks to the courtesy of the Department of State in obtaining the consent of the foreign governments — become the property of the association, the numerous requests for their use could be complied with, and at Teachers' College, New York, Lenox, Riverdale, and Scarborough, either the whole or a portion of the collection was placed on exhibition. In Boston, in February 1898, in connection with exhibits of local schools, they were shown for some days, and in April the requests from southern cities were complied with. All Soul's Mission, Cooper Settlement, Emmanuel Chapel, Grace Church Settlement Industrial School, Industrial School of the Church of the Holy Communion, New York State School for the Blind, Batavia, N. Y.; Pratt Institute, Brooklyn; Public Schools of Manhattan and the Bronx, New York; and Teachers College, New York, agreed to assist in representing the varied methods and interests of the association. The cost of the southern exhibit was defrayed by a number of prominent men interested in the introduction of manual training in the schools, and especially in those of the colored people of the South. It was sent first to Richmond, and some of the Committee on Exhibits were asked to accompany it to give explanations on the use of sewing as manual training.

During the two days of the exhibition the interest rapidly grew. Two thousand three hundred people visited it in that time. Superintendents, principals, teachers, and others asked about the introduction of sewing in the schools. One afternoon was set apart for the colored children and teachers. One old woman was deeply interested. "Yo' say da te'ch dis yere sewin' in da schools in de Norf? We don't have nuffin like det in Richmon'," for what can you 'spec of Richmon' niggah's, de ain't got no more sense than a buzzard."

On the first night James B. Hughes, Esq., inspector of public schools of Toronto, Canada, was present to speak for sewing as manual training, and a large and attentive audience listened to a talk by Mrs. Woolman, of Teacher's College, on the following afternoon, on the meaning of the exhibit, and on the reason for considering sewing a necessary part of the school curriculum. Addresses were also given, by invitation, at women's clubs, and the greatest interest was manifested in the work.

At Hampton the collections were exhibited in commencement week and the students, brought up to know the gospel of labor, to know from experience, of the culture acquired through hand-work, evinced the deepest interest from the first. They showed intelligence and earnestness in the questions and an unusual appreciation of the opportunity for studying the sewing of children from so many parts of the world. It was a Hampton colored man who discovered that Japanese needles (shown in the exhibit) were unlike ours. It was also a colored man who found that the little French waistcoat differed from ours in various ways. They never tired of hearing the description of the processes of textile manufacture, or the connection of drawing and color with the course in sewing. Mr. Hughes and Mrs. Woolman both spoke to the Hampton students and could not but be inspired to do their best by the fine, eager faces and deep attention. Hampton students, both Negro and Indian, have a genius for attention. The collection of exhibits was later shown most successfully in Baltimore under the auspices of the Baltimore Association of Sewing Schools, and a conference was held at Levering Hall, Johns Hopkins University, conducted by a member of the executive board of the New York Association of Sewing Schools.

During the autumn of 1898, requests having been received from Cleveland, St. Louis, Chicago, Indianapolis, Columbus, Minneapolis, Kansas City, Ypsilanti, Ann Arbor, and Cincinnati, satisfactory dates were arranged for the first five cities mentioned and in January 1899, the exhibits used in the previous spring were again prepared for a long journey. The first exhibition was held in Cleveland from January 13 to 18. There sewing is taught in the public schools, in most of the private schools, in the convents, and in ecclesiastical and parochial institutions. At the opening reception, at which President Staley of Case school presided, addresses were made by Mrs. W. B. Warner, chairman of the Kindergarten Sewing School, Miss Jackson, of the manual-training department of the public schools, Miss Virginia Graef, superintendent of the public school kindergartens, Mrs. McGrew and others. Miss Graef spoke on the "Philosophy of the Needle" and of the literature devoted to the subject. Mrs. Warner closed her thoughtful address as follows: "The little message which I have come to bring is a very simple one, but at least it is the production of observation and conviction, and it is this: teach these blunt fingers of ours deftness with the needle and you get results which, in the aggregate are absolutely amazing, if I may not say even stupendous. What do you get? It may be release of an entire community from grinding poverty by the introduction of new interests, it may be escape from dreariness to cheerfulness—that dreariness well-nigh inconceivable

to us, that unbrightened monotony of living which turns many a toiler into a maniac or an imbecile. You get thrift, you get alertness of body and mind, and uprightness of soul, and with the good and the true ultimately you get the beautiful in the revival of old forms which the world cannot afford to lose, in new combinations which may prove of equal value and significance.

VALUE OF HAND TRAINING.

I am not sure that I make my meaning plain, but it is wondrous plain to me—the value of this hand training and the certainty that in days to come it must prove a feature, not as now of some, but of all educational systems. And will it not be a fine bit of irony when our fellow citizens, the Filippinos and Fijians, in return for certain polite attentions paid them in the past by our Dorcas societies, take to sending us really shapely garments, really well made? However that may be, this is true, that the bringing together, the transporting, and the installing of such an exhibition means untold labor on the part of those who have done it; yet I have it in my heart to thank them less for this labor than for their thought and wise progressiveness."

One day was devoted to children and over six hundred were in attendance in spite of very inclement weather.

The collections were shown in St. Louis under the auspices of the ladies of Christ Church Cathedral, who defrayed all the expenses, that it might be open free to the public. They were repaid by the attendance of large crowds. Chicago was the next to receive the exhibits, and Indianapolis and Columbus followed in succession, where much interest was created in those who realized "that the principles of this work and the methods are in reality the foundation stones of America's future progress of the arts and many of the sciences. For surely the child who can evolve and execute as these samples show they have done, is better prepared mentally and physically to be useful than those who are untrained."

A large and successful exhibition was held in April by the Buffalo Association, at which the New York Association was represented by the Public Schools of Manhattan and the Bronx, the Hebrew Technical Institute, New York, the Young Women's Christian Association of Brooklyn, the State School for the Blind at Batavia, and by the Sewing School of St. James's Church, New York.

The association has been requested to prepare an exhibit to be placed in the Musée Pédagogique in Paris, and one also for the Japanese government. The former has been completed, and a large attendance at a Private View held on March 5, testified to the interest in the work of the association. It is represented in the collection by Hampton Institute, Virginia; Industrial School of the Church of the Holy Communion, New York; New York State School for the Blind, Batavia, N. Y.; Pratt Institute, Brooklyn; Public Schools of Manhattan and the Bronx, New York City; Miss Sybil Carter's Indian Schools, and Teachers College, Columbia University, New York.

During the past few years members of the executive board have, by invitation, been present at conferences held in various cities, and in consequence the associations of Buffalo, Baltimore, and Worcester have been formed. Many addresses and informal talks have also been given on methods, textiles, foreign schools, etc., and each winter classes have been held under the auspices of the association for those interested in the teaching of sewing. To meet the growth of educational thought in the schools a series of conferences has been arranged for the present winter, to take place on six

successive Wednesday afternoons in the parish house of the church of the Holy Communion, New York.

Subjects: "The Aim of Education," James Earl Russell, Ph.D., Dean of Teachers College, Columbia University; "The Application of Psychology to Teaching," Frank Morton McMurray, Ph.D., Department of Theory and Practice of Teaching, Teachers College, Columbia University; "Child Study and Sewing," Edward Lee Thorndike, Ph.D., Department of Genetic Psychology, Teachers College, Columbia University; "Sewing in Education," Mary Schenck Woolman, Department of Domestic Art, Teachers College, Columbia University; "The Child and the Work," Mary Schenck Woolman; "The Teacher, the Aim, and the Result," Mary Schenck Woolman.

Classes in sewing and in basket weaving are being held in the same place on Tuesday afternoons.

The officers of the association for 1900 are: president, Miss Jessie Patterson; vice president, Mrs. Woolman; recording secretary, Miss Bucklin; corresponding secretary, Miss H. S. Sackett, Pratt Institute, Brooklyn, N. Y.; assistant secretary, Miss Margaret Stimson; treasurer, Miss A. T. Morgan, 219 Madison avenue, New York. Executive board: Miss J. Patterson, Mrs. Woolman, Miss H. S. Sackett, Miss A. T. Morgan, Miss Bucklin, Miss Stimson, Mrs. Richard Irvin, chairman of committee on classes and lectures; Mrs. H. Archie Pell, chairman of committee on exhibits; Miss B. T. Marshall, 43 West Eleventh street, New York, chairman of literature committee; Miss Dean, chairman of auditing committee; Mrs. Percy R. King, Mrs. A. L. Jessup, Miss Parsons, Miss Fowler, Miss Leverich.

Its membership now includes three associations, the public schools of twelve of the largest cities, and many schools and institutions. As an association is registered as one member, as are also the public schools of a city, it will be seen that it is impossible to estimate the number of teachers and scholars who may be reached by the influence of the association. The aim of the association is to be a center of information and to help every school connected with it, no matter what its location.

JESSIE PATTERSON.

WISCONSIN TEACHERS' ASSOCIATION.

MANUAL Training and Art Education were given a large place in the Forty-seventh Annual Meeting of the Wisconsin Teachers' Association, which was held in Milwaukee, December 27, 28 and 29, 1899. The first general program of the meeting was devoted entirely to these two subjects. It opened with a strong paper on "The General Influence of Art in Relation to Schools and Society," by Professor M. V. O'Shea, of the University of Wisconsin. An abstract of his paper follows:

"The value of art in education and society depends upon a few fundamental principles of human nature. In the first place man, as the scientists say, is an imitative animal. He is constantly reproducing in his own conduct the activities of those about him. We see this in adult life; if my friend at my side laughs I join in with him out of sympathy, as we say. So if I am in the presence of weeping I reproduce what I see and hear without conscious motive for so doing. Thus people imitate the facial expressions, the peculiar manner of gesture, and walk, and speech of their associates. And when one copies in this way his friend for any length of time his conduct comes to resemble that of his friend. His character has really been shaped by his model.

"Imitation exercises a powerful influence over children especially. Most of the activities of the young are imitative. Whatever they behold their elders do they copy. It would not be an overstatement to say that in maturity individuals are more or less faithful copies of the people with whom they have associated.

"Not only people but inanimate objects influence human life through suggestion. One looking at a beam out of plumb, for instance, will be distressed by it. He will try to adjust himself to it, and he will subconsciously be counteracting the tendency to imitation in order to preserve his own equilibrium. Investigations in psychological laboratories show that different forms exercise varied influences upon vital function. Some forms deepen respiration, quicken heart action, and have a general beneficial effect upon life. They heighten the tide of being. Other forms depress the vital functions. They exert an unfavorable influence upon life. So with colors. Some stimulate the organism, urging it on to greater action; while others are soothing, and still others are positively oppressive.

"Now those qualities of things that heighten the tide of life we call beautiful, and we strive to perpetuate them, to keep in contact with them. Mind and body are both benefited by contact with what is beautiful. Those attributes of objects which depress life we denominate ugly, and we seek to avoid them. They are injurious to mental and physical health.

EFFECTS OF ENVIRONMENT.

"There is an environment of representation as there is an environment of concrete realities, and the one has some such an influence upon conduct as the other. A face in a picture will influence one, although perhaps not so forcefully, as that face in life. I recently presented a number of faces expressing different emotions to several adults and it was easy to see that the observers reproduced in their own faces the expressions of the one they observed. Joy begot joy, sorrow produced after its own kind, and so throughout the whole list of emotions. The law is clear: one cannot look upon a face, in life or in representation, without imitating what he sees, and then there will be awakened in his own mind the emotions existing in his model. There is a sort of identity of object and subject in imitations. The imitator molds himself upon that which is presented in all forms of life about him, whether existing in the concrete or only in artistic reproduction.

"We can see then the tremendous importance of art for society and so, of course, for education. Society wishes its young to develop unselfish moral character; and education must provide means and methods for accomplishing this. By surrounding children with the best art it is possible to mold their lives upon noble models. Art seeks to reproduce and make perpetual the best in the world. Further than this, it presents the ideal conceptions of men which become potent agencies in stimulating growth. One gazing upon innocence cannot but be influenced thereby. His personality stretches up to this as a model. So there is greater opportunity in art for influencing conduct wholesomely than in nature or even in the concrete social environment as it exists for many children.

"It should be recognized, though, that a beautiful personality in the life will influence a child's conduct more than it can when presented in a picture. It is of vital importance then that the strongest individuals in the community should become the models for the young who, without fail, will grow like those with whom they associate in the early years.

"The kind of art already spoken of relates to representation of the environment. But there is an art which deals with things and which might be called manual art. It seeks to make over natural forms so that they embody an art ideal. And this is the most important phase of art. There is not an object man touches, but that he modifies to realize some esthetic conception. This must have a profound significance in human life. There must be an esthetic end toward which mankind is struggling, and an effort is made to transform all objects as they are found in their native state in the attempt to realize this end.

"The value of this aspect of art is especially marked when the child becomes a creator. We cannot overestimate the influence upon the child of transforming a piece of wood or iron into a beautiful and at the same time useful object. Day after day he strives to attain his esthetic conception and this work must influence his whole being. This work not only develops patience and persistence, but the whole being becomes adjusted permanently to concrete ideals of the beautiful.

"It happens, fortunately, as we should expect from the care nature takes in fashioning a human being, that what is best for the cultivation of the esthetic in life is most advantageous in the development of the entire being. This is especially true in this connection, since in the early years a child must be active with his hands. The mind of the child develops in the measure that it is called into play to direct the hands. The early training of the young, then, must be principally of a manual character, and this gives opportunity for the attainment of the esthetic ideals involved in the child becoming a creator of esthetic objects.

ART AND UTILITY.

"There are some who believe that there is a conflict between art on the one side and utility and science on the other. It is said that art should exist for its own sake. But this can have no meaning. The esthetic must be useful; it is simply one phase of the useful. In an older day, it is true, art busied itself with fantastic creations, but these times are forever past. What we now need is the useful presented in an artistic way. We need to make artist artisans. Modern mechanical methods make it easy to supply the physical needs of man, but there is no limit to the possibilities of our artistic appreciation. The problem of unemployed labor would be solved in a measure if workmen were at the same time artists. Education should develop art appreciation in the young and the power of developing the artistic side of the materials they work upon.

"So, too, there is no conflict between art and science. Art simply interprets from the point of view of human hopes and ideals the facts of science. Art is more than science, but it can never be independent of science. A true artist must know the world as it is, and his interpretations must ever be truthful to fact. He must simply discern what nature means to man, what she is struggling toward and portray what he finds so that it may be a stimulus and a solace to his fellows."

Professor O'Shea was followed by Mrs. Jean Sherwood, President of Chicago Public School Art Society, who spoke on "Art in Schoolroom Environment," and by Miss Mary B. Moulton, of the Oshkosh Normal School, and Miss Mary E. Tanner, of the Wisconsin Free Library Commission, who spoke on "Picture Study."

Dr. H. H. Belfield, of the Chicago Manual Training School, read a paper on "The Educational Value of the Hand," in which he said that the present need of this country is not more universities or colleges, but trade schools, which shall furnish educated mechanics.

Trade instruction should not be undertaken by the state at this time, but should be supplied by private enterprise. That wealthy philanthropists would give their money for the establishment of trade schools as they now give it to universities, as soon as they understand the pressing need of such gifts, was certain, the speaker asserted. He pointed to the Cooper Institute as an indication that this movement had already begun.

"We generally distinguished between the industrial and the educational values of manual training," said Dr. Belfield, "but the two are sometimes scarcely distinguishable, since a man's industrial value depends in so great a measure upon his intellectual ability and training." It was impossible to train the hand and eye without cultivating the brain.

Dr. Belfield was followed by Mr. M. S. Frawley, of Eau Claire, whose topic was "The Social Aspect of Manual Training."

On Thursday, President Charles Kendall Adams, of the State University, presented to the Grade Section the report of a committee appointed "to consider the advisability of shortening and enriching the course of study in the grades." In brief, this report was: (1) "Do not shorten the grammar-school course;" (2) modify it by "judicial excisions and the substitution of a better and a larger amount of linguistic study, and perhaps geometry and algebra, and the more general introduction of manual training;" (3) "pride in good schoolhouses should be supplemented as rapidly as possible by pride in good teachers."

On Friday State Superintendent L. D. Harvey presented a most interesting paper on "Instruction in Agriculture and Domestic Economy in Rural Communities."

Superintendent Harvey believed that in the field of agriculture and domestic economy there is a useful body of knowledge which can be taught, outside of the existing agricultural and technical schools, to farmers' boys and girls either in existing schools or in schools to be specially organized for such work. In support of this belief he cited the fact that in most of the countries of Europe, and in some of the states of this country such instruction is being given with the best of results. Continuing, Superintendent Harvey said: "Without attempting to go into detail, it seems entirely reasonable to assume that instruction may be given profitably in schools of the grade of our elementary aud secondary schools in the following subjects: The soil, plant life, animal life, economics of agriculture, manual training, and domestic economy.

"For the purpose of giving the kinds of instruction I have been discussing, I venture to suggest the following plan:

SOLUTION FOR THE PROBLEM.

"Extend the idea of county training schools for teachers (Two have recently been established in Wisconsin.) so as to provide for the establishments of country schools for instruction in agriculture and domestic science. Give to any county establishing such a school state aid to the amount of at least one half the sum actually expended for purposes of instruction in such school. Admit to these schools boys and girls who have at least completed the course of instruction in the elementary schools, and who have reached the age of sixteen. Provide for courses such as I have already considered in discussing the body of knowledge which should be taught, including manual training, and make the course two years in length. Add to the courses already indicated such instruction in language, literature, history, and mathematics,

as may be carried on in connection with the other work. Such a school should have in connection with it a small tract of land to be used for illustrative and experimental purposes; not the line of experiments which the agricultural experiment station undertakes, but a more simple line which could be carried on under the direction of the teachers, and which would be of value for observation and training purposes. Such a school could give, in addition to the other work, a great body of the work now given in the short courses in agriculture offered in our agricultural colleges, and it would carry on the work in some lines, considerably in advance of what is now undertaken in those short courses. Such a school centrally located in a county would furnish an opportunity for attendance by residents of the county, at a very moderate expense."—*Reported.*

MINNESOTA EDUCATIONAL ASSOCIATION.

THE opening session of the High School Council was held in the Hall of Representatives, Capitol Building, St. Paul, on the afternoon of Tuesday, December 27. The meeting was a contribution to the discussion of present high-school problems. It was marked throughout by catholicity of view and a recognition of the fact that the modern secondary school should meet the demands of modern life — not merely city life but country life as well.

The session opened with an address on "The Complete High School," by Principal J. C. Bryant, of St. Paul, president of the council. Mr. Bryant paid high tribute to the State University, and expressed his appreciation of its quickening influence on the lower schools, but he did not believe that the state high schools should exist merely to feed the university. "The public-school system is based upon the idea that all are entitled to equal educational opportunities, with the further supposition that educational methods will be adapted, as far as possible, to individual tendencies and abilities." The high schools have in a measure lost sight of this idea. Mr. Bryant would "bring the work of the schools as near to the work of life as is practicable without narrowing and crystallizing." He quoted from Dr. Nightingale, of Chicago, who has pointed out that the lamentable loss of pupils from year to year in the secondary schools is largely due to a faulty program of study. "The young people of the nation must be furnished opportunities for such an education as the natural endowments seem to foreshadow, and which will be of most value to them, We shall not have, then, so many physicians that ought to be farmers, so many lawyers that ought to be blacksmiths, so many preachers that ought to be peddlers, nor so many failures in business because of mistaken vocations."

In expanding his subject Mr. Bryant said, with reference to the present system in Minnesota: "The high schools are further called upon, and, in fact, this is by many supposed to be their chief reason for existence, to prepare students for the State University. In this they have been fairly successful in respect to the departments of Science, Literature, and Arts — the old college course. Although large numbers have been sent to the colleges of Law, Medicine, Dentistry, Pharmacy, etc., they have gone with comparatively little preparation. The articulation of these courses is very imperfect. Most often the entire machinery of the high school is run in the Latin or classical groove, and there is no other way to reach the university. It is often at some sacrifice in efficiency and directness, that the pupils reach the desired lines of study in the university. It is hoped that at this session of the high-school council we may make some progress toward a complete high-school curriculum.

"This complete high-school curriculum will prepare students for all the courses offered in the state university. While the body of the curriculum shall contain studies common to all lines and for general culture, the characteristic studies leading to the various departments — normal schools, university departments, and local demands, must all be distinctly defined and placed. The state high schools practically prepare for one college in the university. This opens the high-school course to the criticism of being technical, which, in the eyes of some educators, is a very grave charge. But if we turn our attention to the agricultural school we find an institution supported by the state, and endowed by the nation magnificently, for the single purpose of giving a technical education to farmers. The agricultural school is practically a high school. Its success has been phenomenal. Indirectly it has vastly increased the value of farm lands in Minnesota by giving a market value to its agricultural products and in making farm life more attractive for the young, and checking the plethora of the unskilled in the cities whom, heretofore, barren farms have driven to its excitements.

"Here we have two technical lines pursued in high-school work, both measurably successful. If two, why not four, since this is the number generally agreed upon?

"The argument is now plainly before us. Two lines of technical work have been pursued in the high schools. One is a preparation for the literary and the other for the farming classes. Have not the industrial and commercial classes equal rights? Skilled mechanics in foreign countries secure places before our youth, whom the abandonment of the apprentice system has left with little training for skill. Those engaged in commercial and industrial lines constitute a vast army, and their needs are just as pressing as are those of the agricultural and professional classes.

"The question might arise as to whether there should be state industrial and commercial schools on a par with the state agricultural school. Is this simply an agricultural country? Are we not fast becoming a manufacturing country, with our iron mines and forests and water powers, or a commercial country situated on the very arteries of rail and water transportation? Our manufactured products are put down with profit at the very doors of our foreign competitors. Pillsbury's Best is known around the world. Our locomotives are moving Russia's cars.

"If, then, the agricultural school was established to strengthen agriculture, for the same reason industrial and commercial schools should meet the apprentice systems of the old world.

"It must clearly be seen that very few of the students of the agricultural school ever go beyond its limits and enter the College of Agriculture. This is therefore a technical school preparing, not for the profession, but for the practice of agriculture, for the rank and file, or at best for the non-commissioned officers, while the College of Agriculture trains the captains of agriculture.

"Should we not then train the non-commissioned officers of industry and commerce for practical service to meet the industrial and commercial expansion, and enter the eastern "open door" equally prepared with the representatives of every nation?"

The second speaker of the afternoon was Mr. J. E. Painter, supervisor of manual training in Minneapolis. His subject was "Manual Training in the High School." The first part of his paper was devoted to an argument in favor of manual training, in which he took occasion to allay certain fears which often seize men trained in the classical schools when they come to discuss manual training. His paper ended with

the following practical suggestion: "Were I the superintendent or the principal of a high school in a small town and wished to introduce manual training, my first care would be the teacher. I would exercise as much or even more care in his selection than I would in the choice of a teacher for any other department or subject. Then I would at least place him on a par with my best teachers in point of salary. I would put him in charge of the science, mathematics, history, or literature — in short, would use him wherever I could do so to the best advantage. Then, under his guidance, would plan my work in manual training, and make a beginning as soon as the proper conditions could be brought about. And this would not be difficult with the right man in charge. I would extend the work gradually, at first attempting only so much as could be thoroughly done. In this way I believe any town large enough to support a high school would, in the course of three years, be able to offer to any student a thorough course in manual training. Results obtained under right conditions would be convincing, and the people and the Board of Education would rally to its support.

"I am frequently asked where such teachers as I have described can be found, and as a rule I am compelled to say that I know of no one that is available. There are such, but the demand is as yet so much greater than the supply that they are not long out of a place. For this reason I believe it is the duty of this body and all similar bodies of teachers, to urge upon those in authority over our normal and other training schools the necessity of providing adequate facilities for training in this line of work."

Superintendent A. C. Tibbetts, of St. Charles, Minn., read a strong paper on "Commercial Training in the High School." He would have more modern language and less Latin and Greek in the high schools, and especially more mother tongue. He did not advocate a short and narrow "business college" course, but a broad and rich course of training giving special preparation for commercial pursuits. The leading thought of his paper is suggested in the following, which he quoted from Professor Edmund James:

"We can conquer the uneducated and half-educated people of this country for secondary and higher education only by offering them courses of study which, while they are of a strictly educational character in the best sense of the word, shall also have some bearing on their future, everyday life — shall have some direct relation to the work they are called upon to do in the world. In Austria, France, Germany, Belgium, and Italy, and in Japan, business education has come to be recognized as an essential part of the educational system of each country."

Dr. H. W. Brewster, of the State School of Agriculture, discussed "The Relation of the School of Agriculture to the High Schools." The Minnesota School of Agriculture stands in the same relation to the university and to the common schools as does a state high school — it is between the two. It is in a sense a state high school. Pupils come to it from the common schools and can go from it to the university. This plan of organization, often spoken of as "the Minnesota plan," has been remarkably successful in adapting itself to the needs of those who desire an agricultural education.

The discussion of the papers was opened by Principal George Weitbrecht of the Mechanics Arts High School, St. Paul, who spoke in favor of enriching the high-school course without leaving out any of those studies which have been considered essential. "Latin does something for a boy that nothing else does; the same is true of algebra, drawing, modeling, and the study of the beautiful. My scheme is not to cut something out, but to add something."

Dr. Folwell, of the University, said that the schools must take up manual training and industrial work. He also spoke in favor of adding two years to the high-school course.—EDITOR.

QUERIES.

1. WHICH is the best way to treat blue prints to be used by the boys? "I have tried mounting on cardboard, but perhaps somebody has hit upon a better plan."

2. How much latitude in the choice of models should be left to the teacher? and how much can be safely entrusted to the pupil's own initiative?

3. Is there any better method for fixing responsibility for tools for general use than the "check system" so often used in manufacturing establishments?

4. What has been done by teachers of manual training to change the size or form of tools so as to better adapt them to the needs of children in the lower grades of the grammar schools?

REPLIES.

1. The blue-print system in the Stout Manual Training School, of Menomonie, Wis., is one of unmounted blue prints, kept in stock and placed in glazed frames when in use. All the shopwork is done from blue prints kept in these frames near the place of work.

The prints are cut to standard sizes, the same as the glass of the frames. Each course has its own size of print and frame. The frames are made with removable backs, and are capable of holding the prints of the entire course. These frames are kept on the walls of the carpenter shop and are taken to the bench by the pupil when needed. In the wood-lathe room the frame is mounted on the back shelf of the lathe by hinges, and held in place by a rod which hooks on the frame, so any angle of inclination may be given the frame. These frames are kept by the forges on small stands, which also hold small tools. In the machine shop the frames are kept on the machines or hung near-by on the walls.

These frames are made of clear pine, and cost about fifteen cents. They are easily handled, and take up much less room than any other way of treatment. The ease with which any change in the blue prints of the course is made saves much time.

The work in mechanical drawing is exhibited in frames provided with removable backs, which are fastened in the frames by buttons. The frames are hung in panels of five from the molding. These panels are hung side by side, so that any amount of surface may be covered. A progressive exhibit of the work done in the classes may easily be shown by this system.— F. W. KENDALL, Menomonie, Wis.

3. In every manual-training shop it is necessary to have, in addition to the individual tools, certain extra tools which are usually kept in a tool-room or closet. This tool-room is supposed to be a place where pupils are not allowed to enter without permission. In certain machine shops all trouble is obviated by having a pupil in charge, with a system of checks, but this is not practicable for the average school. The method of giving out certain tools and keeping track of them has always been unsatisfactory with me until the following plan was tried: Take bits for example. All bits in the shop, including full set and duplicates of sizes in ordinary use, are arranged in a movable rack. Screw-eyes are placed on the back, by which it can be hung in its regular place on the wall. The same is done with inside calipers and round-nose turning tools.

If any of the above tools are to be used by a class, the rack is hung on a screen *outside* of the tool-room. At the end of a lesson the teacher can check the tools at a glance; a vacant place means a missing tool. When not in use the racks are hung back on wall.

For polishing on the lathe, six shellac bottles are set in holes bored in a wooden base.

This is, perhaps, a very small matter in itself, but for the influence which system has on the boy, and the effect that loss of tools has on the inventory taken at the end of the year, little matters should receive careful attention.— WALTER G. WESSON, Worcester, Mass.

[We wish to depend entirely upon the voluntary contributions of our readers for both questions and answers in this department. We would be glad to publish several short, pointed answers to each question. If possible, they should reach us six weeks before the date of publication.— EDITOR.]

BREVITIES.

THE Western Drawing Teachers' Association will hold its seventh annual meeting at Grand Rapids, Mich., May 2–5.

The Eastern Art Teachers' Association will hold its second annual meeting at the Massachusetts Normal Art School, Boston, May 24–26.

THE Rochester Athenæum and Mechanics Institute has announced a summer school for teachers from July 9 to August 4, 1900. The drawing will be taught by Principal E. C. Colby of the Department of Industrial and Fine Arts; the manual training by Director W. W. Murray of the Department of Manual Training. The success of the school last year ought to insure large classes this year.

NATIONAL EDUCATIONAL ASSOCIATION.

The National Educational Association will meet at Charleston, S. C., July 7–13. President Keyes, of the Department of Manual Training, is at work on a program that is sure to attract a large number of teachers to this first meeting of the department under the new name. His plan at present is to have three sessions, one devoted to "Courses of Instruction in Manual Training for Elementary Schools," a second to "Courses of Instruction in Manual Training for High Schools," and a third to the president's address and the business meeting. Two speakers of wide reputation, holding different views, are being selected for each of the first two sessions. In each session these two will be followed by perhaps four brief discussions, and then a general discussion. Colonel Francis W. Parker, president of Chicago Institute, will be one of the two leading speakers at the session devoted to the elementary school.

The question of an exhibit is under consideration. Ample hall space has been promised, and a definite announcement concerning this feature of the meeting may be looked for soon. Send to Irwin W. Shepard, secretary of the National Educational Association, Winona, Minn., for official bulletins when issued.

EASTERN MANUAL TRAINING ASSOCIATION.

THE Eastern Manual Training Association will hold its annual meeting for 1900 on June 28–30 in the city of Cleveland, O. Mr. R. Charles Bates, president of the association, writes that a strong program is scheduled. It is not fully made up, but

will include addresses by Professor Charles R. Henderson, of Chicago, and Miss Hope, of Boston. All sessions are to be stenographically reported. A full day will be given to "field discussions" and visits to schools in Cleveland, Exhibits will be received and handled at Cleveland — *i. e.*, drayage and packing — free to exhibitors, they to pay freight charges to and from Cleveland. Mr. William E. Roberts and his assistants in Cleveland are taking active measures to make the meeting successful in every way. Committees have been organized, each assuming responsibility for certain parts of the work. They concur with the executive committee of the association in desiring to make this meeting one of interest and helpfulness, especially from an educational point of view. Work to which they will give particular attention will be an endeavor to interest manual-training workers of the middle states in the coming meeting.

CANADA.

SIR WILLIAM C. MACDONALD, of Montreal, who has given about two and a half million dollars to McGill University, proposes — as noted in the January number of *Manual Training Magazine* — to bear the expense of introducing and maintaining for three years manual-training schools in suitable centres throughout the Dominion of Canada. In Ottawa provision is to be made for about one thousand boys in the public schools between the ages of nine and fourteen years. Schools will also be established at Brockville, Ont.; Charlottetown and Summerside, P. E. I.; Truro, N. S.; Fredrickton, N. B.; Winnipeg, Man.; Calgary, N. W. T., and at least in one place in both Quebec and British Columbia. These centres have been selected in the belief, that nearly all educational movements begin in cities and spread into the surrounding country districts, and that a beneficent influence can thus be quickly exerted upon education throughout the Dominion.

The plan includes the employment of teachers of ability from England, Scotland and the United States; and the sending of Canadian teachers to Great Britain and Sweden, next summer, to take a training course, and to personally observe educational methods.

Professor James W. Robertson, who has charge of the Macdonald educational fund, recently visited the manual-training schools of Boston, and was so well pleased with what he saw that he purchased equipment for sloyd schools for twelve centres.

Professor Robertson has been for a long time interested in this project, and takes a progressive and comprehensive view of the subject. In a lecture, delivered in Ottawa last November, he said: "The aim should not be a formal literary education plus manual training; but education of which manual training is an integral and highly valuable part. The object and order should be to train the child with system and care to observe, to interpret, to construct, and to describe. It is educational handwork, not trade hand-work."

He places much confidence in the published report of the Royal Commission of National Education in Ireland, which, about two years ago, took the evidence of 186 persons competent to testify upon the subject of manual training, and which visited 119 schools in England, Ireland, Scotland, Sweden, and Denmark. A commission, conducting its work in a similar manner, has recently been considering the introduction of American sloyd into the public schools of Australia. — CHARLES W. PAUL.

A SCHEME has just been made public by the governments of Nova Scotia, Prince Edward Island, New Brunswick for the establishment of a joint polytechnic school

for the three provinces. Though no details are yet given, it seems likely that a school to give courses in Mining, Mechanical Engineering, and Agriculture may be founded at some time, but not in the immediate future.—LEE RUSSELL.

BOSTON.

THE educational department of the Twentieth Century Club, Boston, is conducting a course of sixteen lectures by prominent educators. Professor Patrick Geddes, of University College, Dundee, and head of University Hall, Edinburgh, in addressing the club, approached the educational problems of today from the standpoint of a biologist, and a practical sociologist. He finds a basis for the division of labor into trades and professions, in the primitive geographical distribution of mankind. He believes that skill in woodwork had its origin among fishermen. In building their boats, the ability to make good joints became a necessity, for their lives were at stake. From the forester, rolling his log, came the wheel, the inclined plane, and other mechanical contrivances.

In speaking to the Twentieth Century Club upon Reformatory Education, Mr. Frank B. Sanborn, who was a pioneer in the advocacy of the principles upon which the work of the Elmira Reformatory is based, says that this institution, which first used manual training as a means to character building in criminals, has made to physiological psychology larger contributions, of a practical nature, than have come from the universities or from other sources in this country.

PROFESSOR V. L. GEORGE, of the Boston Normal Art School, in a recent address before the manual-training committee of the New England Conference of Educational Workers upon "The Esthetic Side of Manual Training," emphasized the desirability of placing before the pupil manual-training models, which in outline and decoration were in accordance with classic standards of beauty. Upon the blackboard, in a very practical and interesting way, he contrasted the correct and incorrect forms of chairs, balusters, moldings, vases, plates, etc., explaining the underlying art of utility, variety, contrast, unity, and dominant form.—CHARLES W. PAUL.

AT the February meeting of the Woman's Education Association the subjects and speakers were as follows: "Technical Training for Girls," Miss Caroline B. Weeks, Pratt Institute, Brooklyn, N. Y.; "Industrial Training for Girls," Miss Edith Howes; "Technical Training Abroad," Miss Selma Wesselhoeft; "Legal Status of Manual Training in the United States," Mrs. Ellen H. Richards.

A general discussion followed. During the meeting the following interesting figures were given: In 1894 manual training, aside from drawing, had been introduced into 93 cities and towns in the United States; in 1896 into 121; and in 1898 into 146. Of the latter 33 are in Massachusetts, though the 146 cities and towns are distributed over 28 states. The school law in Massachusetts states that after September 1, 1895, every city of 20,000 or more inhabitants shall maintain as a part of its high-school system the teaching of manual training, the course to be approved by the state.

CONNECTICUT.

A MEETING of the New England Association of Teachers of Metal Working was held at Hartford, Conn., on December 1 and 2.

Members arriving on Friday visited the Columbia Electric Vehicle Co., the Pope Tube Works, the shops of the Pratt & Whitney Co., and the evening classes of the Hillyer Institute at the Hartford Y. M. C. A. Saturday morning was spent in an

inspection of the Hartford Public High School and the business meeting of the Association. In the afternoon the members listened to a detailed description of the processes of manufacture of a modern shop device given by Mr. Johnson, superintendent of the Dwight Slate Mfg. Co., of Hartford; An interesting paper on "Academic Work and the Shop; their Relation and Correlation," was presented by Mr. Holden, of Lynn, Mass. Mr. Phelps, of Waltham, Mass., read a paper on "The Beginnings of Steel Work with a Class in Forging." All the topics brought out profitable discussion.

The officers for the ensuing year are: president, Charles B. Howe, Hartford, Conn.; vice president, Frederick W. Turner, Cambridge, Mass.; secretary-treasurer, Charles Abbott Davis, Providence, R. I.—F. W. TURNER.

WASHINGTON, D. C.

THE plans for the new manual-training high school, for white pupils, call for a three-story-and-basement, fire-proof building of gray, Roman-shaped, pressed brick and buff Bedford stone. It is approximately 210 by 100 feet, though not rectangular at one end. In the rear are two light areas in which, at the basement level, about three feet below grade, are the foundry and forge rooms. Besides these the basement contains boiler, fuel, engine, and fan rooms, an armory and drill hall, toilet, locker, bicycle, and storerooms and rooms for use of the janitor. The first floor is occupied by main and private offices and waiting room, class rooms, assembly hall, machine shop, and wash room. On the second floor are more class rooms, a study hall, wood-turning and pattern-making shop, modeling and carving room, rooms for teachers, and toilet rooms. The third floor includes suites for physics and chemistry and for freehand and mechanical drawing, dark room, rooms for sewing, cooking, and other work for girls, and toilet room.

The building as thus indicated is not to be erected at one time. The portion now to be built omits most of the rooms for the work of girls, several of the class rooms and the assembly hall and defers the permanent location of the machine shop, foundry, wood-turning and pattern-making shop, and the mechanical drawing rooms. The former will now be placed in the room designed for the foundry which, in turn, will occupy the room with the forge shop. The woodworking room will occupy space on the first floor intended for class rooms and corridors. The mechanical drawing will use one of the rooms designed for the freehand work. Briefly, the technical course as now conducted in the Central High School will be furnished with a home of its own, growth for a few years along existing lines and the beginnings of work along new lines will also be provided for, but the future construction is to be depended upon to complete and to perfect the building.

The building is to be wired for power, light, clock, signal-bell, and telephone systems. The interior woodwork will be Georgia pine. The finish of the main entrance and vestibule will be white marble and quarter-sawed oak. Class rooms are expected to seat forty pupils each, with a total capacity of 500, and the shops to accommodate twenty at a time, each. Drinking fountains are to be placed in each corridor and all shops and drawing rooms will have ample toilet conveniences. The laboratories will be supplied with cold, hot, and distilled water and gas, steam, pressure, and suction. The shops will be electrically driven by current from the generator of the school. Lighting current for evening work will be similarly derived. Each shop instructor will have a small office adjacent to or within his shop.—J. A. CHAMBERLAIN.

CALIFORNIA.

AT the State Teachers' Association at Sacramento this year the friends of manual training and drawing got together and formed an organization to be known as the "Manual Training and Drawing Teachers' Association of California" with James E. Addicott, professor of manual training at the San Jose Normal School, as president; Ronald P. Gleason, director of manual training in the Oakland schools, secretary. The other members of the advisory board are: R. D. Yelland, the well-known artist, who is a professor in the Mark Hopkins Institute of Art in San Francisco, and instructor in free-hand drawing in the University of California; Paul A. Garin, instructor in drawing in the Mission High School of San Francisco, and Walter A. Tenney, supervisor of drawing and manual training in the public schools of Fresno.—R. P. GLEASON.

THE Pacific Coast Manual Training Association has been organized, with Charles A. Kunou, of Los Angeles, as president; Miss Edna A. Rich, of Santa Barbara, vice president; Arthur H. Chamberlain, of Throop Polytechnic Institute, secretary; and B. F. Simcoe, of San Diego, treasurer.

FOR the first time in its history, the University of California, at Berkeley, has decided to give credit for work done in freehand drawing. Professor Kower, of the University, is authority for the statement that forty high schools throughout the state have asked to be accredited in this line of work, and at least a portion of these may hope to receive recognition.

MR. E. S. GOSNEY, of the visiting committee of the Territorial Normal School at Flag Staff, Arizona, has been visiting various institutions through the country. He hopes to have several of the manual arts as portions of the course of study in the Flag Staff school.—ARTHUR H. CHAMBERLAIN.

THE Wilmerding School of Industrial Arts opened on the eighth of January with an enrollment of seventy-six boys. This number has since increased to one hundred and forty—the maximum number that can be accommodated this term. Many more who are desirous of entering have filed applications and will be admitted next term, when there will be facilities for a larger number of students.

This school was founded by the late J. C. Wilmerding, of San Francisco, who bequeathed to the regents of the University of California the sum of $400,000 on condition that they "establish and maintain a school to be called the 'Wilmerding School of Industrial Arts' to teach boys trades, fitting them to make a living with their hands, with little study and plenty of work." In the words of its director, Mr. Everett Schwartz, formerly of Waltham, Mass., "This school is designed, according to the will of the donor, to be an institution of high order as a trade school, and at the same time an educational institution. The academic course includes only such branches as will develop the powers of reasoning and accuracy, and help the pupils generally in all their shopwork. Thus a real and close correlation exists between the two lines of work, and each exerts an educative force supplementary to the other, and the result is a sound, intellectual, ethical, and practical product. The object of this school is to promote technical and industrial education by teaching boys trades, fitting them to earn a livelihood, and to give to the world young men who will go out and enlighten and ennoble honest work."

It is to be a trades school, with a six months' preliminary manual-training course. Next fall it will add departments of bricklaying, plastering, and plumbing. It will

confine itself to the building trades, while the Lick School, the California School of Mechanical Arts, which is on an adjoining lot will limit its work in the machinery trades. The Lick School has therefore ceased to offer an apprentice course in carpentry and will discontinue its efforts in the direction of stone work. At present the Wilmerding School is occupying a temporary wooden structure which has been erected at a cost of $25,000, its plan being to construct a large brick building by student labor.—Geo. A. Merrill.

COLORADO.

The Denver Manual Training High School, which was begun in 1893 by providing only the necessary shops and recitation rooms for a small school of less than 250, has recently been enlarged and completed so as to accommodate 650.

Manual training in the Denver public schools, below the grade of high school, consists of drawing, hand and tool-work for boys, sewing for girls, and elementary cooking lessons for the girls of the eighth grade.—C. A. Bradley.

MINNESOTA.

Judge Elliott's reversal of the supreme court decision on the special school tax law for Minneapolis lifts the financial cloud that has been hanging over that city for the past two years or more. The new ruling places an additional $60,000 in the hands of the Board of Education during the present year and also insures the future. This probably means that manual-training work will again go forward in the lower grades and soon be on a firmer basis than ever before.

There is evidence that interest in manual training is steadily growing throughout the Northwest. In addition to the reports of the mid-winter meetings of educational associations in Wisconsin and Minnesota, given on another page, the following quotation may be cited from a recent letter written by Mr. J. E. Painter, Supervisor of Manual Training, Minneapolis:

"I had a very satisfactory interview with the University authorities this week. Heretofore they have scarcely recognized our work in manual training at all. Now, with some changes in their course and a few slight modifications of our course, they propose to give us three full credits in drawing and two in shopwork. This is a gain of three full-term credits over anything we have been able to secure previous to this time."

ST. LOUIS.

All believers in manual training must rejoice that at last it has taken firm root in the public schools of St. Louis. For eighteen years the St. Louis Manual Training School has stood as an object lesson to the people of St. Louis and the whole world. Other cities have seen its good works, believed in its methods, and adopted its essential features; the public schools of St. Louis have waited. Now with Dr. C. M. Woodward as president of the Board of Education the work of organizing manual training is going forward. The appropriations for the purpose are yet small but they are evidently being used most effectively. The next step is likely to be the establishment of a manual-training high school with a capacity of 1500 pupils, boys and girls.

The fifth annual meeting of the North Central Association of Colleges and Secondary Schools met in St. Louis March 30 and 31. Among the topics announced for discussion was "Industrial Education in Secondary Schools," by Principal C. E. Emmerich of the Indianapolis Manual Training High School, also a report of a committee on technical schools by Director George N. Carman, of Lewis Institute, Chicago.

NEW YORK CITY.

A NEW schedule of shopwork exercises for the public schools of Manhattan and the Bronx has been issued by the Supervisor of Manual Training, Dr. James P. Haney. The classes affected by the change are those of the last five half-year terms of the grammar school, viz., 5 B, 6 A, 6 B, 7 A, and 7 B. The most important change occurs in the first of these, where knife-work, which may be done in the regular class room, is substituted for bench-work. The stock to be used in this grade is principally one eighth inch basswood.

In the other grades the models have been materially changed, many of a more utilitarian character having been introduced and several tool exercises discarded. It is hoped that the revised course will appeal more forcibly to the boys' interest while in no degree sacrificing the orderly arrangement of exercises or the educational value of the work. It is understood that the new course is tentative, and will not be issued in printed form during the current term.

At a meeting of the corps of shopwork instructors held at the Supervisor's office in January, some slight modifications of the proposed schedule were adopted.

Carefully graded courses of instruction in other lines of manual training, such as paper cutting and folding, freehand and mechanical drawing and applied design are in course of preparation, and will be published soon in pamphlet form.

REGULAR monthly meetings of the New York Manual Training Teachers' Association are held at Public School No. 30. Several interesting questions suggested by the proposed new course of models formed the chief topics of discussion at the December and January meetings.

THE sixteenth anniversary of the establishment of the Hebrew Technical Institute was commemorated by the annual reception of the Women's Committee at the institute building, Stuyvesant street, where specimens of pupils' work were on exhibition. The models exhibited gave evidence of the thoroughness of the work of the school, those in the electrical department being of a particularly interesting character.

President Hoffman's annual report, read at the meeting of the Board of Directors, showed the progress of the school to be most satisfactory. Graduates found no difficulty in obtaining employment. There are at present about two hundred pupils enrolled.

AN entertainment under the auspices of the Armstrong Association of this city was given at the Berkeley Lyceum on Lincoln's birthday for the benefit of the Hampton Normal and Agricultural Institute. The program was made up of dramatic and musical numbers rendered by a company of Hampton students. The entertainment was very creditably carried out and realized the sum of about $1200.

A SERIES of Teachers' Classes and Conferences, under the auspices of the New York Association of Sewing Schools, was held at the Parish House of the Church of the Holy Communion during January and February. Of the addresses delivered at the conferences three were by Professors Russell, McMurry, and Thorndike, respectively, and three by Mrs. Mary S. Woolman, all of Teachers College. At the evening classes sewing and basket weaving were taught.

A collection of exhibits representing the work of the association, prepared for the Paris Exposition, was on view at the Parish House on March 5.

W. F. VROOM.

ILLINOIS.

IT is certain that in the State of Illinois there is a deep and growing interest in manual training. One finds unmistakable evidence in the work of the associations for the promotion of domestic science instruction in the public schools and in the programs of women's clubs. The city of Princeton, for example, has a Domestic Science Association and a Woman's Club that are arousing the people of the city to an appreciation of the deficiencies in their public schools in the way of hand-training. Mrs. Hannah Ohman Barr, of the Jewish Manual Training School, Chicago, recently addressed the Woman's Club on "The Educational Value of Manual Training," and a discussion of a similar subject is announced for March 23.

THE Northern Illinois Teachers' Association will meet at Aurora, April 27–28. The general subject for discussion is: "Industrial Training as a Factor in Education," and a large exhibit of constructive work is being planned. At the meeting of the Superintendent's and Principal's Round Table on the evening of the 26th, Mr. Ira M. Carley, of the Chicago Normal School, will lead in the discussion of the topic "The Relation of Drawing and Manual Training to Arithmetic, Language, and Geography." At the general session on Friday morning, Mr. Charles A. Bennett, of Peoria, and Mr. Robert M. Smith, of Chicago, will speak on "Constructive Work in Public Schools." The discussion will be opened by Miss Flora Wilber, principal of Teacher's Training School, Moline. On Friday afternoon manual training will occupy a part of the time of two section meetings, and in the evening all will have an opportunity to listen to a lecture by Mr. J. Liberty Tadd, of Philadelphia, on the subject: "Art and True Manual Training." At the general session on Saturday morning a paper on "Industrial Training as a Social Factor" will be presented by Mr. F. A. Manny, of the Oshkosh (Wisconsin) Normal School, and another on "Coördinate Training of Eye, Hand, and Mind, from the Pedagogical Point of View," will be given by Dr. George E. Vincent, of the University of Chicago. The discussion at this session will be opened by Miss Cora M. Hamilton, principal of the training department of the Pontiac High School.

THE Pullman Free School of Manual Training has been incorporated. On the 15th of February the first steps were taken toward the realization of Mr. George M. Pullman's plans for providing free instruction in manual training to the children of the town of Pullman; articles of incorporation were filed at Springfield. By the terms of Mr. Pullman's will, made public October 28, 1897, $1,200,000 are to be used "for the founding, erection, maintenance, management, and endowment" of this school. The steps already taken are some of the preliminary legal ones, and several months are expected to pass before work on buildings is begun.

THE exhibition of public-school art work, held last year at the University of Illinois, was such a success that a special bulletin has been issued announcing a similar exhibition this year. It will be held in connection with the University High School conference, the Interscholastic Oratorical Contest, and the Interscholastic Athletic Meet, May 16, 17, and 18 — gala-days at Illinois. Four book prizes are offered.

CHICAGO.

THE speaker of the day at the February meeting of the Principals' Association was J. Liberty Tadd, of Philadelphia, who gave an illustrated address on "New Methods in Education" to a large and attentive audience. It is pleasing to notice

that Professor Tadd has abandoned ambidexterity as being everything, and now makes it but an incident in the training of the whole child. His address may be epitomized by the words, "A training of the eye and hand to obey the mind and to execute all its orders so that the whole human being may be fitted in every way to cope with the problems of life." The lecture was profusely illustrated by stereopticon views, showing the students in the shop or at work drawing. The repetition of the same forms very often showed that the idea of the school is to drill and repeat till the movement becomes automatic and the hand performs its work without the conscious intervention of the will.

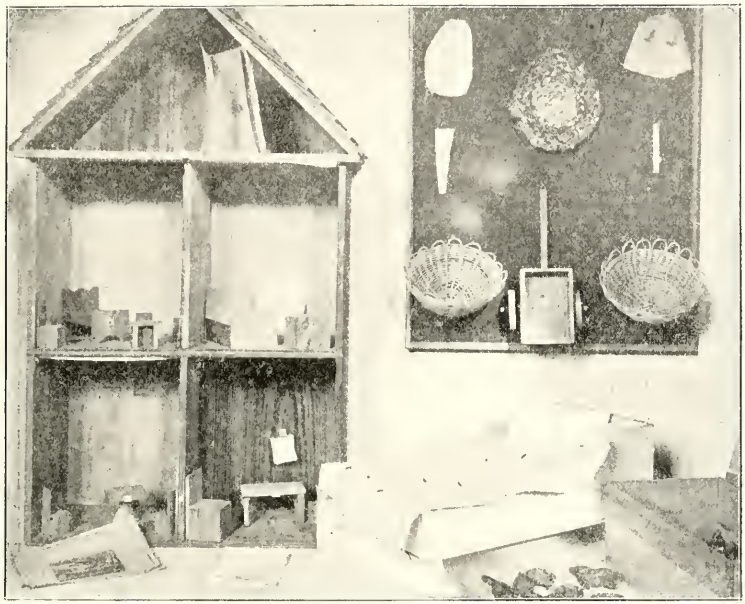
It is interesting to know that the work shown by Professor Tadd is not common to all the schools of Philadelphia, but is confined to the Public School of Industrial Art, to which but two pupils from each public school in the city are admitted. It is to be regretted that in cases like this the lecturer does not tell the audience the full conditions under which his work is performed.

Mr. R. M. Smith, supervisor of manual training, was the speaker at the February meeting of the Manual Training Association. His topic was "Technical Elements *versus* Useful Objects." In general, Mr. Smith's idea was that almost every object constructed in the manual-training shop should be for use, as it thereby presents an added element of interest to the student. "The child loses interest when working on detached elements which do not lead to any combination. Having nothing to take to pieces and build up again, he cannot find the delusion of personal action."

At the time of our last writing it was hoped and expected that the financial condition of the Board of Education would be so materially improved with the opening of this year that all departments of manual training would be broadened and strengthened, but the politicians and lawyers were too much for us, and the buzz saws of the Board of Review, the Board of Equalization, Judge Tuley, and the Supreme Court have each taken a whirl at our appropriations, and our hopes have gone into sawdust and kindlings. We have no idea where we are. For a generation the general repairs, cleaning school buildings, etc., have been paid for out of the funds of the Committee on Buildings and Grounds. Suddenly, in the wrong year, and when too late to remedy it, some one discovered that all this had been illegal, and all these things must be paid for out of the different appropriations for school maintenance. This leaves a large deficit in the funds for school maintenance. Already some of the chairmen of committees have warned the principals and supervisors under them that they must keep within their appropriations, and that when their funds are exhausted they will close the departments and schools. It is to be hoped that such a misfortune will not overtake us, but, if it should, it would be a most effective teacher to the people.—ALBERT R. ROBINSON.

THE new building of the Chicago Institute is to cost about $600,000. In order to give the Institute a good start, Mrs. Emmons Blaine is said to have guaranteed an annual income of $95,000 for a term of years.

MR. J. H. TRYBOM, of Boston, recently appointed supervisor of manual training and the domestic sciences in the public schools of Detroit, Mich., began his work there January 12. Mr. Trybom has worked out a course in cardboard construction for the lower grammar grades and a course of work in paper for the primary grades. His plan is unusually comprehensive, consisting of graded manual-training work even including the high schools, though for the present the course is to be tried in the elementary schools only.—*School Journal.*



NEW KINDERGARTEN WORK AT HAMPTON INSTITUTE.

[The above illustration is from a photograph of an exhibit of kindergarten work that attracted much attention last summer at the meeting of the Eastern Manual Training Association. The credit for this work is due to Miss Blanche Finlay, the teacher under whom it was done. All she claims for it is that with the little ones in her class last year it worked well. Her statement, made at our request, is given below.—EDITOR.]

THE work represented in the above cut has been substituted in the kindergarten department of Hampton Institute (for colored children) for the more conventional occupations of paper-weaving, card-sewing, paper-folding, etc. In this free way we get better results than formerly in reasoning, number, construction, and have a really substantial model.

The material is all prepared beforehand; the children merely put it together and nail. The shingling of the house was class work, also the doll's cradle, mattress, puff and trunk. The furniture in the house and the cart were individual efforts.

The bag and coat in the upper corners of the panel were free basting; the mat just below is of silk strips braided and sewed round and round. The baskets are single-thread weaving. The saw and hoe are prepared pieces nailed to wooden handles. The clay work to be seen in the lower part of the cut just below the cradle is mostly creative work. The scrapbook and duster on the table in front of the house were made with a running-stitch.

EDITORIAL.

Every manual-training teacher should take a personal interest in the meeting of the National Educational Association at Charleston, S. C., July 7 to 13. Secretary Shepard, in his Official Bulletin No. 1, has assured every one who attends that meeting of low temperatures, refreshing sea breezes and a southern welcome. President Keyes, of the Department of Manual Training, has assured us an unusually strong program. His selection of two vital topics and speakers known to have convictions indicates that something definite will be accomplished at the meeting. The questions grouped about the subject of electives in high schools are certainly fundamental, and no one will think to question the advisability of giving the subject of manual training for the elementary schools a thorough airing — even salt air will do it no harm. In this matter of courses or no courses, or what for the lower grades, it is certain either that some of us are on the wrong road or that we are in very different parts of the same road; we are certainly not together. It may be that we have all set our faces toward the Celestial City, but if so it would seem that while a few may have reached the Delectable Mountains, some are still in the Slough of Despond. Others are afraid of the lions, or are in deadly combat with Apollyon, while not a few have been allured by the sights and sounds of Vanity Fair. We have not yet heard whether any have reached the land of Beulah. Let us go to Charleston and find out.

It seems very clear to us that the most economical way to put manual training into the elementary schools — especially into the lower grades of the elementary schools — is to put it first into the normal schools. Yet we often hear of manual training being introduced into the elementary schools of a city before it has been given a place in the normal school in which most of the teachers for that city are being trained. If the manual training of the elementary schools is to be taught by the regular teachers of these schools, which at the present time is usually the case, except in the higher grammar grades, then it would seem folly not to begin their training for this work while they are in the normal school, especially if one remembers that the skillful

use of tools is much easier to acquire before the age of eighteen than after. Even if they were never to teach manual training at all there would still be good reasons why these normal-school students should receive instruction in manual training. They certainly need the added power of expression that comes through manual training, and they need to understand the principles underlying it, and to catch the spirit of constructive work in the schools.

When manual training really gets into the course of instruction in an elementary school, it at once becomes so vital a part of the school work that every teacher in the school must have something to do with it. It becomes one of the centers of interest for teachers and pupils alike. In other words it becomes an element in the work of the school with which every teacher must be somewhat familiar in order to teach the other elements to the best advantage. A teacher in the fourth grade, for instance, needs to know as much of the fundamentals of manual training as she does of the fundamentals of mathematics. This cannot be gained by a study of books. No amount of theory will take the place of even a little practice. No one can possibly be duly appreciative of manual training as a factor in education — much less be successful in teaching it — until he knows from experience what it means to work out a definite purpose by the skill of his own hands.

If a city or a county or a state is seriously intending to make manual training a part of the work of its elementary schools, one of its first steps should be to give that subject an adequate place in its normal schools. This may or may not mean that every normal school pupil shall pursue a course in constructive work particularly adapted to the grades of children she is preparing to teach. This is comparatively unimportant. What is important is that each graduate of a normal school shall go forth with an appreciation of the spirit and purpose of manual training and such a mastery of its vital elements that she can devise manual-training work that will be suited to any set of conditions she is likely to meet in the first five or six grades of the elementary school. When this has been done the question of who shall teach manual training in the lower grades will have disappeared, and with it several other questions that arise on account of untrained teachers and their narrow point of view.

Moreover, this is not imposing an unbearable burden upon students in normal schools. Just as working out or expressing thought in

concrete, material form helps the thinking of the child so it does of the adult, though perhaps in a less degree. The normal-school student will find the manual training a direct aid in her science and her mathematics, and it will suggest new methods of teaching other subjects, so that instead of being a time consumer, it will be in the best sense a time saver — it will make the time count for more in real growth in power.

In this connection we are glad to call attention to Mr. Gustaf Larsson's brief article on "Sloyd for Normal Schools," in number three of the *Sloyd Bulletin*. After speaking of the encouraging progress that is being made by manual training and of the importance of an intelligent interest in it on the part of the regular teachers in the schools, he says:

Coöperation, harmony, and enthusiasm are necessary all along the line to make the benefits of manual training as far reaching as possible; and our normal schools should be wellsprings of these essentials. While normal schools cannot be expected to prepare special teachers or supervisors of manual training, it is possible for them to give their graduates such an understanding of the subject that they will see for themselves the reasons for its introduction into the schools, and be both able and eager to coöperate with a special teacher or supervisor. The requisite understanding, however, cannot be gained by simply reading or theorizing about the matter.

The value of tool-work is most truly appreciated by those teachers who have learned to use tools. Not until his muscles have learned to act in accordance with the purpose in his mind can a teacher fully realize that manual training possesses educational possibilities contained in no other form of school work.

The principles of education which are taught in the normal schools are also the underlying principles of manual training. Psychology, child-study, and physiology, all point directly to manual training as a necessary factor in organic development.

The regular instruction in these branches combined with one hundred hours of rightly planned bench-work, would not only make normal graduates intelligent about manual training, but would give them new power as teachers of any subject.

TWICE during the past quarter our attention has been called to an article on "Hoodlumism," written by Elbert Hubbard, first by one of our contributors who read it in its original form in the October number of the *Philistine*, and again by another who read it in the December number of *New York Education*. We are aware that taking an article out of its original setting in the *Philistine* is depriving it of half its charm, but this particular one is so much to the point that we are sure it can stand even that proportion of loss and yet be like a refreshing draught to the reader of pedagogic literature. With the permission of the author we quote in part:

There is an idea in the minds of many to the effect that the country is an idyllic place to bring up children. Far away from the busy haunts of men, out of the mad rush and tumult, clear of the dust and din of factories, and beyond the reach of vice and depravity — there will we let the little souls fresh from God develop and expand. The singing birds and nodding wild-flowers shall be their companions, and into their hearts shall be absorbed the sunshine, and the sounds that make melody through the branches.

Oho!

I do not wish to appear boastful of our town, but I'll hazard the challenge that there are a dozen boys hanging around the railroad station in East Aurora who can give pointers in depravity and general cussedness to any set of city youngsters you can produce. And East Aurora is far more civilized now than it ever was before.

The author then tells of a fond mother in Cleveland who sent her two sons to East Aurora last summer that they might rusticate for a month on the old farm. The result was quite contrary to expectations; instead of getting a glimpse of "bucolic ways" they gained a remarkable insight into the arts of hoodlumism.

Hoodlumism springs naturally into being, like everything else, when the conditions are ripe. The right conditions are idleness and a lack of incentive toward the higher life.

They say people talk gossip in the country, but gossip is only lack of a worthy theme. Having nothing else to talk about, folks turn and talk of each other; and if they rend characters and rip reputations up the back, it is only a sign of mental poverty. Get a man interested in poetry, art, sociology, and he talks of these. Set him to work at some useful employment that calls into being his higher faculties — the love of harmony, proportion, color — and his mind will revolve around these things, and of these will he converse.

Hoodlumism betokens the vacant mind and idle hands. The boy may have glimmering desires to do something useful and be somebody, but he lacks direction — there is none to take the lead. He craves excitement, and as the railroad station is the busy center, he gravitates there "to see the train come in."

He gets acquainted with the tramps who hang around the water tank and pumping engine room.

Soon he times the way freight, and curries favor with conductor and brakeman by helping unload boxes, bales, and barrels. He learns to climb over freight cars, to set the brake, to board a train in motion.

He is allowed to ride up the road to the next station. He gets off there, and while waiting for a train to take him back, goes over to a farmhouse and strikes the farmer's wife for a hand-me-out, as he has seen the tramps do.

He gets it.

And lo! it is an epoch in his life — he has learned that he can travel free, and get food without work. At heart he is a tramp and a criminal — he takes something without thought of giving an equivalent.

The next move is by hook, crook, and stealth to take the thing without going through the formality of asking for it. If the farmer's wife refuses the food, why just locate the chickens that roost in the trees, and at night go get them! "The world owes every man a living."

In the commodity of manhood, the villages supply the best and worst. Those with ambition and aspiration seek a field where their powers can find play; the rest for the most part hang upon the fringe of hoodlumism.

* * * * * * * * * * * * * * *

The cure for hoodlumism is manual training, and an industrial condition that will give the boy or girl work — congenial work — a fair wage, and a share in the honors of making things. Salvation lies in the Froebel methods carried into manhood. You encourage the man in well doing by taking the things he makes, the product of hand and brain, and pay him for them, supply a practical, worthy ideal and your hoodlum spirit is gone and gone forever. You have awakened the man to a higher life — the life of art and usefulness — you have bound him to his race and made him brother to his kind. The world is larger for him — he is doing something — doing something useful: making things that people want.

All success consists in this: you are doing something for somebody — benefiting humanity; and the feeling of success comes from the consciousness of this.

Interest a person in useful employment and you are transforming chaos into cosmos.

Blessed is the man who has found his work.

REVIEWS.

BOOKS

The Philosophy of Teaching. By Arnold Tompkins. Ginn & Co., Chicago. 5 x 7 in., pp. xii+280. If Professor Tompkins had made his book *The Science of Teaching* instead of *The Philosophy of Teaching*, we should almost certainly have had a better book. As it is, the aim implied in the title has led to the introduction of a large quantity of abstruse and, to the average reader, bewildering metaphysics, and has caused the style in many places to be that of one struggling to express ideas which are not clear even to him, and which have no accepted terms to express them. One sentence may be cited which, if examined in its context, will illustrate the defect in the style: on page 82, "But, to become professional, the quality must be given the form of unity in the process of mind growth." The context does not make clear what "quality" is meant; why it should be "*form* of unity" and not "*unity*" does not appear; and with these phrases so vague we can attach no specific force to the following words —"process of mind growth."

This evil is present in mild form in the section on the "Teaching Process" and "Aim in Teaching;" the abstruseness and obscurity, however, are naturally far more serious in the discussion of the "Universal Law of Method." There is great danger that the difficulty of this portion will quite dishearten the average teacher; but if he preseveres he has a reward in the comparative clearness and refreshing concreteness of the next portion, "Specific Phases of the Law," and in the lofty tone and great sweep of the remainder, "The Process as a Complex Whole."

After this condemnation of the form and partly of the matter, it is only just to say that the book certainly contains a most accurate conception and a most noble view of teaching; the two steps in the process of education, "Thinking the Individual" and "Thinking the General," are set forth and brought into relation with the

familiar work of actual teaching. Rightly viewed, the book is also a protest against the prevalent crime of teaching algebra or grammar or the like, instead of teaching the pupil.

A few errors of the class of "activities *is* strengthened" (p. 57) may, perhaps, be charged to the proofreader; but we regret to see the author of the "Science of Discourse" say "he *girts* the continent" (p. 56) and "*posted in* (academic studies)" (p. 83). We are also surprised to read the statement that "physical causes are more certain to be followed by their effect than moral causes" (p. 236). Of course the writer does not mean that, and he presently shows us what he does mean. These defects, however, suggest haste; perhaps haste has had something to do also with the heavy and badly expressed metaphysics and psychology, and the obscurities of style.

The book, as it is, contains ideas of eminent power and value in such a form as to discourage and baffle those who most need them. It ought to be rewritten.— E. O. Sisson.

Plaster Casts and How they are Made. By Frank Forrest Frederick. William T. Comstock, New York; 5 x 7½ in., 132 pages; price $1.50. This book is much more than its name is likely to suggest to the reader of monthly book lists. It is a carefully written, well arranged, practical treatise on clay modeling and casting in plaster, to which is added luminous historical notes and a large number of valuable recipes. Having read even the first two chapters of this book one will ever after have a much higher and truer appreciation of the art of the "plaster man." The chapter headings give a more definite idea of the scope of the book: Introductory — historical notes — care and use of modeling clay — supports for clay models — gypsum — materials for casting — waste molds — casting from waste molds — waste molds from modeling in the round — casting from vegetables, fruit, and flowers — casting from life — piece molds — elastic molds — wax and sulphur molds — supports for casts — mending casts and modeling in plaster — shall casts be colored? — oiling, painting, and other finishes — cleaning and packing casts — to make plaster set quickly or slowly — names of statuary and reliefs.

Planning and Planting Home Grounds. By Warren H. Manning, published by the Stout Manual Training School, Menomonie, Wis.; 5¼ x 7½ in., 76 pages. This handbook, as the author states, is intended "to induce people to study and plan the arrangement of their home grounds, however small these may be." Besides a chapter on "Planning and Planting" it contains a list of 644 trees and plants, arranged by families. Of each of these is given the common name, botanical name, where native, height to which it grows, kind of soil it needs, other desirable conditions, color of flowers, etc. Every one of these 644 has been or is to be planted in the grounds of the Stout Manual Training School, or may be found within a short distance of the school. The book has been written to suit the particular climatic conditions of Wisconsin and the adjoining states, though most of the information it contains is as valuable in any other northern state.

Course of Study, Manual Training Department of the Elementary Public Schools, Chicago, 1899–1900. Prepared by R. F. Beardsley; published by the Board of Education. This volume of 296 pages was prepared for the use of the teachers in the Chicago schools, and indicates the high-water mark reached by the Department of Manual Training under the supervision of Mr. Beardsley. It contains: Introductory chapter on the subject of manual training in general; hints on methods of teaching

drawing and manual training; directions for teachers, being for the most part rules and regulations of the Manual Training Department; courses of study — a four-years, a three-years, a two-years, and a one-year; working drawings of more than 175 models; a chapter on chip-carving; another on constructive work in various materials, such as manila paper, strawboard, withered twigs, round wire, flat wire, and paper pulp; book mending, written by Principal Waldo Dennis of the Park Manor School; descriptions of the important woods of the United States, alphabetically arranged; notes on tools, arranged by Mr. Grant Beebe; the file and filing, by Professor W. H. Van Dervoort, of Champaign; designs for the equipment of a manual-training shop; inventory of equipment, giving approximate cost of each article; list of supplies furnished school shops in Chicago; and the bibliography of manual training, prepared and first published by the American (now Eastern) Manual Training Association.

One disposed to criticise could find many faults with the book. No doubt he would find fault with some of the models shown, but in doing so he might overlook what seems to be the spirit and purpose of the course as a whole. We are not likely soon to agree on detailed directions to teachers or on questions of beauty and fitness in the design of models, but we are or ought to be practically unanimous in believing that the chief purpose of manual training is the development of the powers of the individual pupils "through spontaneous and intelligent self-activity," and there is a rapidly growing appreciation of the fact that a given series of models is not equally well suited to the needs of all the individuals of a given class. In training individuals, individual needs require individual treatment. The fact that influences of environment and occupation sometimes sway whole groups of individual pupils — classes, schools — in certain particulars proves nothing unless it be that the whole problem is the more complex on account of that fact.

On this point Mr. Beardsley says: "No set of models can express the manual training idea, nor can any definite course of work be applicable to all of the diverse conditions to be met in one city or even in one school, consequently the courses shown are arranged merely as a base from which to work." He recommends that there be a closer connection between the work in the shops and that in the class rooms, and that objects of use in the school as well as those of use in the home be made by pupils in the manual-training classes. Consistent with this idea of flexibility in the course of instruction — to allow of adaptation to individual needs — one finds among the designs suggested three different designs for pencil sharpeners, six for match safes, five for paper knives, six for bicycle racks, five for pencil boxes, seven for waste baskets, etc.

It is, then, particularly on account of the means suggested to bring this element of flexibility into the manual-training work in Chicago that this book will be of interest to teachers of manual training in other cities. While imperfect in many details the spirit of the book is progressive.

American Woods, Part I. By Romeyn B. Hough. Published by the author at Lowville, N. Y. 6¼ x 9 in. This work consists of twenty-six cards of mounted thin sections of American woods. Each card contains three actual specimens of wood from the same kind of a tree — one transverse section, one radial, and one tangential. The card is merely a frame for holding and protecting the wood sections. Each species is labeled with technical, English, German, French, and Spanish names. Whenever possible, each species is represented by both sap-wood and heart-wood. The text contains an introductory chapter on the structure of trees, their leaves, flowers,

fruit, and seeds, and the physical properties of woods. Then follows a glossary, a key based upon the flowers, one based upon the leaves, and one upon the fruit. The remainder of the book is devoted to a systematic study of the species whose woods are represented in the accompanying sections. Of each species is given its specific characteristics, habitat, physical properties, uses, medical properties, and any other dersirable information not falling into one of these classes. The work is unique and admirable in every way. It ought to be found in every school library — especially in every manual training or technical school library.

PAMPHLETS

Western Drawing Teachers' Association.—Report of Peoria meeting, April 1899. This report contains more than the usual amount of matter interesting to teachers of manual training on account of the fact that the handicraft side of art education was given more prominence. Mr. James Hall's address on the "Craft and Literary Side of Art Instruction in Public Schools," struck the key-note of the whole meeting. We quote a few sentences which ought to be read and re-read by every teacher of manual training: "Decoration must always be fit, and an object to be beautiful does not always require decoration. Morris' rule, 'Have nothing in your houses that you do not know to be useful and believe to be beautiful,' is a safe guide. But the form of the dishes for the most menial use, the stove, the coal hod, the chairs, table — in fact, everything necessary for use, should be constructed of pleasing proportions. Compare an old colonial kitchen with a modern one; ours is more convenient, perhaps, but it is also usually more ugly. Convenience need not imply ugliness. Things should be made convenient first and then beautiful. The principle of beauty in simplicity is a principle little understood. *Honesty of construction is one of the fundamental principles of artistic workmanship*, and honesty of construction, I am sorry to say, is a thing too seldom found in the manufactures of America. The lack of beauty in common things more often results from the *introduction of bad ornamentation* to cover up sham or slack workmanship than from any other cause."

Circulars of Information.

Chicago Institute. The most attractive school announcement of the season has just come from Colonel Parker's new school, Chicago Institute. At the top of the first cover page is a colorotype reproduction of the architect's water-color drawing of the new Institute Building, which is to stand facing Lincoln Park. Inside are shown pictures of both the front and the rear views; also floor plans of this most interesting building. A study of these plans reveals the fact that the building has unity and light corridors — two qualities not always found in large school buildings. Moreover, it is obviously planned for the use of a definite kind of a school. It contains several unique features which are sure to attract much attention. The announcement contains a preliminary statement concerning the academic school, the pedagogic school, the summer school of pedagogy, and courses open to the public. The summer school for 1900 will open July 2 and close August 10.

Public School Reports.

Moline, Ill., 1899. In this report Superintendent William J. Cox gives a brief historical sketch of manual-training work in the Moline schools. This report also contains a picture of a high-school class of girls at woodworking, and another of the recently equipped department of domestic science.

Minneapolis, Minn., 1899. Contains a very carefully prepared outline of sloyd work for grades four to eight inclusive.

Received, the following, some of which will be given more extended notice in our next number:

School Sanitation and Decoration, by Severance Burrage and Henry T. Bailey. D. C. Heath & Co.

The School and Society, by John Dewey, Ph.D. The University of Chicago Press.

Healthy Exercises, by Robert H. Greene, M.D. Harper & Brothers.

Useful Arts and Handicrafts, by Charles G. Leland. (1) Designing and Drawing; (2) Dyes, Inks, Lacquers, Varnishes, and Polishes; (3) Wood-Carving for Beginners, revised by Frank H. Ball and George J. Fowler; (4) Gouge-Work. The Photo-Beacon Co., Chicago.

Report of United States Commissioner of Education, 1897-8, Vols. 1 and 2.

The Algebraic Solution of Equations of Any Degree, by L. A. Buchanan and J. Lewis André, Stockton, Cal.

Buchanan's Gear Chart, by L. A. Buchanan. A practical treatise on the design and construction of cogwheels for the use of draughtsmen and patternmakers. Published by author at Stockton, Cal.

BRADLEY... ...STANDARD **WATER COLORS**

WE HAVE put on the market Educational Water Colors in several styles, to complete, in the only logical way, our System of Color Instruction.

Our system contemplates the use of the six Standards, and we claim that there is no real economy in a smaller number; but for those who still prefer a more limited palette, we have a box containing large cakes of the three so-called Primary Colors, Red, Yellow, and Blue, together with a Gray.

PRICE LIST

Water Colors, dry in small cakes, in an illuminated metal box, black and gold, containing eight cakes, the six Standards and two Grays. Per box, ... $0 25

Water Colors, semi-moist in pans, in a box of similar design, blue and gold, containing the same eight colors. Per box, . . . 35

Water Colors, moist in Tubes. These are made in the six Standards and three Grays, warm, neutral, and cool. Per tube, . . 10

Water Colors, dry in large cakes, four cakes in a box, Red, Yellow, Blue, and Gray. Per box, ... 20

Standard Mixing Palette, containing seven compartments for receiving moist colors from tubes, and two large mixing compartments. Postage, 25 cents. Per doz. . $0 60

Little Artists' Complete Outfit, comprising a Mixing Palette with its seven pans filled with semi-moist colors and a good brush with handle, the whole enclosed in a strong cardboard case. Postage, 3 cts. Each, 15

Artists' Camel-hair Brushes, No. 6, wooden handles. Postage, 3 cents. Per doz., . . 75

Japanese School Brushes, bamboo handles. Postage, 6 cents. Per doz., ... 60

Water Cups. Postage, 13 cents. Per doz., . 60

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MANUAL TRAINING MAGAZINE

JULY, 1900

THE RELATION OF THE MANUAL TRAINING SCHOOL TO THE COLLEGE OF ENGINEERING.

T. C. MENDENHALL,
President of Worcester Polytechnic Institute, Worcester, Mass.

BOTH in logic and mathematics in order to determine the relation of two things it is desirable, if not indeed necessary, that each should be accurately defined. Relations may be ascertained, it is true, without quantitative limitations upon the dimensions of the things compared, as in the case of the diameter and circumference of a circle, but an accurate definition of each is none the less required.

In the present instance it will be extremely difficult to comply with this condition. The school or college of engineering, having existed in one form or another for at least a third of a century, has acquired a certain number of tolerably well-settled characteristics, and although in some respects it is still in the process of evolution, as it must always be, its principal functions are generally agreed upon and well understood. In the earlier days of science teaching, applied science and pure science were studied and taught very much in the same way. It was very much a matter of the acquisition of knowledge by the use of text-books and memory. The student was expected to, and could, become familiar with what others had done, the facts they had observed, and the laws or principles they had discovered. If ever he did anything himself, if only in the application of these laws and principles, it was after he had completed his education. As everyone knows, all this has been changed during the past thirty years, and the student now expects to be and is trained, during his college course, in the *art of doing things*. This can only be accomplished by requiring, or, better perhaps, permitting, him to do things, during his undergraduate years, of the same kind and as nearly on the same scale as possible as would

come to him in the practice of his profession. It is even necessary to go farther than this and to include the doing of many things which he may not be called upon to do later, but which he must have done by others, and upon which he must sit in judgment. An engineering college must own, therefore, not only the library and text-book in which the principles of the use of the transit and level, the engine and boiler, the dynamo and motor, the balance and the eudiometer, are described, but it must actually possess the transit, level, engine, dynamo, and all of the rest, and its faculty must include men who are skilled by actual experience, professional if possible, in their use, and the well-trained student must, at the time of his graduation, have much knowledge of and some skill in the use of all the principal appliances, instruments, machines, and materials with which he will have to do, either directly or remotely, in his professional career.

This much is said to emphasize the fact that the college of engineering is distinctly a professional school, or as nearly so as existing conditions will allow. Unfortunately the accepted traditions relating to the time one may profitably devote to fitting one's self for life-work compel the engineering colleges, without one single exception at the present moment, to enlarge their courses of study so as to include many subjects that are non-professional in character, belonging rather to that group of studies essential to the production of what we call a liberally educated man. But many of them are included only because they are a necessary preliminary to the purely professional subjects, as, for instance, mathematics, physics, chemistry, etc. It must be admitted, therefore, that the end and aim of colleges of engineering is the production of engineers, trained so as to give the best possible assurance of success in their respective professions, and only incidentally to *educate* in the sense in which that word must, or at least ought to, be used by the state.

The manual-training school, on the other hand, is almost invariably a part of the general public educational system. There are, it is true, many private foundations, and to them certain remarks that I shall presently make do not apply. The type of school to be considered is the manual-training school as a department of a system of public education.

At this end of the discussion we are confronted with the difficulty of knowing just what the manual-training school is, at the present time, and the perhaps still greater difficulty of knowing what it ought to be. It is of too recent origin to have become crystallized either as to form

or substance. It has come in response to a real want, and, in my opinion, it has come to stay, but in form and substance materially different from that in which it now generally appears. Perfection is never possible, improvement always. Nothing bars progress so much as the assumption that perfection has been attained, or even that we are on the right road to reach it. All true friends of education must welcome the frankest discussion and most pointed criticism of any departure from well-established courses and practices, and I shall take the liberty, therefore, of incidentally making brief comment upon some features of the development of manual training in the public schools that I deem injurious.

We are constantly forgetting the real object of public education. It is all but universally admitted in theory, although often ignored in practice, that the state must educate and does educate to insure its own safety; that men are not fit for citizenship under a democratic government unless they are educated. A training which enables men to reason logically, to think clearly, and to act wisely and with courage is enough to prepare them for any part it may be their fortune to play in affairs of state, however exalted or humble it may be. The fundamental principle upon which our nation rests is that of equality before the law and equal opportunity to all. It is our proud boast that here everyone is truly the architect of his own fortunes, and, if there be any division of society into "classes," every man may determine and does determine into which he will go. The state cannot, without a perversion of fundamental doctrine, do anything to imply or direct that the son of A shall be a blacksmith, while that of B shall be a merchant, of C a lawyer, or of D a clergyman. Primarily the importance to the state of the son of the blacksmith is just as great as that of the child of the lawyer or of the merchant, and his prospective attitude on possible public questions just as full of significance. Is there any reason, as far as the interests of the state are concerned, why he should be any less thoroughly trained than they?

The action of educational authorities in this country has been greatly controlled by two notions, both of which would be esteemed foolish in moments of sober and thoughtful reflection. One of these is that every new educational scheme or doctrine is a good one; and the other is that whatever is being done in Europe is much better than anything we have attempted here. The first of these needs no comment. By the second our educational system has been profoundly influenced, and often most unfortunately. In Europe the "class" system still prevails,

practically everywhere, but especially in the German empire, of whose educational methods we seem singularly fond. It is but natural that there the scheme of public education should tend, on the whole, to perpetuate class distinctions, but it is unnatural for us to educate to create them. It is impossible and improper in this place to go extensively into so large a subject, but its bearing upon the organization and character of schools for manual training will be, I think, quite evident.

In many cases such schools have had their origin in the plain, unvarnished desire *to teach trades*, or at least to fit the student for earning his living in some manufacturing or industrial occupation. *To be able to earn money* has lately come to be the noblest ambition of many American youths, and the state is being called upon to assist in devising ways and means for acquiring so admirable an accomplishment. Everybody interested in manual-training instruction knows that in the majority of cases the "manual-training or industrial high school," or even the manual-training department of the general high school, is looked at askance because it is supposed to be created for and especially adapted to the wants of those who, for some reason or other, are expected to be always what we call "laboring people." Indeed, it is almost, if not quite, the very first appearance of anything in the American common school of the "I am holier than thou" sort.

As such the manual-training school could be viewed only with apprehension and anxiety, but fortunately these are abuses, not legitimate uses, of a most valuable educational process.

The *raison d'être* of the manual-training school can be sufficiently well established upon a purely educational basis. Argument to prove this is no longer necessary, for it is universally admitted that a properly arranged course in elementary handicraft develops faculties and furnishes a desirable discipline not hitherto reached. It has long been noted that a large number, perhaps a large majority, of leaders of men, in this country, have been bred, at least during their boyhood, in the country rather than in the town. The majority of the fathers of presidents of the United States were farmers, and it is unquestionably true that nothing else so tends to develop the "all-around man" as country farm life. But it is also a matter of observation that during the past quarter of a century such a revolution has taken place in the methods and results of agriculture that this, the greatest of all "fitting schools" is now almost a thing of the past. Its chief merit was its almost perfect coördination of the working of the eye, the hand, and the brain, and manual training is the best substitute for it we have yet

found, joined, as it usually is, with elementary instruction in the observational and experimental science.

It is threatened, however, with the danger of *overdoing*, which, indeed, in many instances it has not escaped. In our anxiety to do something we have often done too much. Hundreds of thousands of dollars have gone into costly buildings and expensive and unnecessary equipments. Elaborate courses have been worked out, requiring an undue share of the time of the pupil, and through the commendable but misguided ambition and enthusiasm of directors and instructors these courses are made to include many things properly belonging to the school of engineering, and which the student ought not to attempt until he has reached years of maturity. What is most unfortunate is that the manual-training school has often been made into a separate establishment, offering itself as a substitute for rather than a contribution to the usually accepted requirements of a sound elementary education.

I have said so much, perhaps too much, about what I conceive to be prevailing errors in the development of manual-training schools and courses, because I wish, in considering their relation to schools of engineering, to take them as they ought to be rather than as they are. One of the greatest difficulties with which teachers of engineering have to contend at this time is that students come to them as *dabblers*. They have dabbled a little with almost an infinite variety of things, but have never learned to do anything well and thoroughly. The capacity for hard work, for painstaking, patient, concentrated effort, for clear and independent thinking, is painfully lacking. Manual training promises to be much in the way of an antidote for this dreadful disease, if only care is taken to make the best of its possibilities.

To be more specific, the work of the manual-training school can never take the place of a properly organized course in "shop practice" for the mechanical or electrical engineer, but it may make unnecessary a good many hours of work now assigned to such a course. The mechanical egineer must be thoroughly conversant with machinery, its use, its production, and its products. The knowledge he must gain is of the working of the machine considered purely as a tool; of the physical properties of the various materials upon which it may work; and of the methods and processes by which that material is molded into definite forms, the outcome of a definite plan for the purpose of accomplishing a definite result. Only a relatively small part of this knowledge is actually acquired in the shop; a larger share of it comes

from the text-book, lecture-room, and laboratory, but in shop practice it may find its material expression.

A large share, sometimes one-quarter to one-third, of the time devoted to shop practice in a course in mechanical engineering is given to wood-working. From the engineering standpoint there are two important ends to be reached in wood-work practice. First, it affords a convenient introduction to shop- and tool-work. Being mostly handwork, facility in the use of hand tools is acquired; by working from drawings from the start skill in reading and understanding them is attained. Although there is not much variety in the material used in the wood-room, that material is still important from a constructive standpoint, and a knowledge of its treatment and preservation is valuable.

Second, the wood-shop practice in pattern-making is of prime importance to the mechanical engineer. Pattern-making *per se* has little significance, but a knowledge of the requirements and limitations of the molding-room and pattern-shop are absolutely necessary to the successful designer of machinery. I see no reason why manual-training schools may not assume entirely the first of these two functions of the wood-shop, and thus put many hours at the disposal of engineering schools for other purposes. Pattern-making I do not consider a legitimate exercise in manual-training schools. If indulged in to any extent, it ought to be followed by exercises in the foundry, the establishment and equipment of which in connection with a system of public schools is an inexcusable waste of money. I think engineering schools will gladly take care of the pattern-making, if teachers of manual training will look out for the rest.

I am also of opinion that in metal-working schools of manual training may save many hours of valuable time to the engineering college. But I do not think that this would require, or in its best phase even admit of, the extensive and costly equipment of machine tools of which some schools boast. In my judgment the least educative of all of the operations with which we are dealing is what is ordinarily known as "machine-shop practice." I would not be understood as saying or thinking that familiarity with the use of the lathe, planer, shaper, grinder, and other machine tools is not extremely valuable and quite indispensable to the training of the mechanical engineer. What I mean is that, considered from the educational and not from the technical point of view, and comparing hour with hour, there is much more discipline of brain, nerve, and muscle in the wood-shop or at the

forge. Little "wool-gathering" is possible in either of the latter without bringing the work to disaster.

A certain amount of hand metal-work, such as chipping, filing, scraping, etc., is very desirable, and this is good work for the manual-training school. It is valuable in revealing various physical properties of the metals worked upon, besides affording a good example of processes neither possible nor necessary in the treatment of wood. Where convenient, the simpler operations with machine tools may be undertaken, and, solely for the purpose of furnishing standards, construction of the simplest machine elements would be useful. But care must be taken not to allow the machine-shop to rob the forge-room, where the most valuable hours of the whole course may be spent. In forge-work much that is required in the engineering courses ought to be anticipated by the manual-training school. Indeed, the work is especially adapted to such schools, and to it ought to be allotted a larger share of the total hours of practice than is generally the case.

In most schools shop instruction is accompanied by a more or less complete series of lessons in free-hand and mechanical drawing, and these may easily be such as to be accepted in lieu of a corresponding number of hours in engineering courses.

It seems reasonable to suppose, therefore, that the manual-training school, or, what I prefer to say, the manual-training work of a system of public schools, may and should, even when restricted in its operations in accordance with the conservative views expressed above, do a good deal of the work now thought necessary to be done in the college of engineering; that in doing this it need never lose sight of its purely educational function as a part, very important, but never large, of a scheme of public instruction. It may also be especially helpful in aiding young men to find themselves; to reveal and develop a taste for the study of applied science; but more than in any other way, or in all other ways combined, the school may help the college by sending to it young men who have been trained to honest, hard, independent labor, whether intellectual or physical; who have learned that wax cannot conceal or varnish cover errors due to head or hand, who detest and avoid "dabbling" and all forms of dilettanteism, and whose best ambition is to do work that is better than it seems rather than that which seems better than it is.

CONSTRUCTIVE WORK IN ELEMENTARY SCHOOLS.[1]

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CONSTRUCTIVE work, or manual training, has come to be so generally recognized as an essential element in the best education that no argument in its favor is here necessary. When the subject is now under discussion in educational gatherings of this kind, the purpose is to discover the place it should occupy in education, what form it should take in the schools, what should be its relation to other school subjects, the best method of teaching it, and ways and means of introducing it, always taking into consideration present conditions or conditions that are likely to exist in the near future.

1. If manual training is to occupy a part of the time of the pupil in school, the question immediately arises: Where shall this part be found, in the high school or the elementary school? Or shall it occupy some of the time of each? Shall it take a certain number of hours per week, running through both schools? Or shall there be a gradation in the proportion of time given to constructive work?

The best current opinion on the subject I believe to be unquestionably in favor of placing the maximum proportion of constructive work in the lowest grades of the elementary school, and the minimum in the highest grades of the secondary school, except for students who are preparing for life-work in some manual industry or technical pursuit requiring great hand skill or intimate acquaintance with trade processes. In the more specific words of Professor O'Shea, of the University of Wisconsin:[2] "With the progress of the child through the schools, manual training should occupy a less and less important place, except for those pupils whose wills in maturity are to be manifested primarily in energizing and coördinating muscular action. A boy who is to be a carpenter should continue, in all stages of his educational course, to make manual training of this special sort his most important occupation; his organism should keep adjusted to this way

[1] Abstract of paper read before the Northern Illinois Teachers' Association at Aurora, April 27, 1900.

[2] MANUAL TRAINING MAGAZINE, January 1900, page 69.

of action. But a boy who is to deal with questions of jurisprudence or medicine or education will suffer arrest in his evolution if he is kept too long at work with his hands." This does not necessarily mean an actual gradational decrease in the amount of school time given to formal instruction in manual training as the child advances from grade to grade — it might even mean the reverse — but it does mean that of the total amount of effort put forth by the child in connection with his school work, inside and outside the school, the proportion devoted to constructive manual activity should become less and less as he advances from grade to grade. But it is needless to talk about "less and less" until we have more, or at least some, except as such a discussion may help us to see more clearly its great importance in the lower grades of school work.

More than ten years ago (1888) an eminent English scientist, Dr. James Crichton-Browne, made public the results of his investigations on the training of the hand, and since that time his conclusions have been verified and reiterated many times. After showing that the development of the motor centers of the brain hinges in a large degree on the movements and exercise of youth, he gave it as his opinion that the nascent or development period of the hand centers extends from the first year to the end of adolescence, and then he added: "There can be no doubt that its most active epoch is from the fourth to the fourteenth year, after which these centers become comparatively fixed and stubborn. Hence it can be understood that boys and girls whose hands have been left altogether untrained up to the fifteenth year are comparatively incapable of high manual efficiency ever afterward." Professor O'Shea has recently said: "At all stages in the life-history of an individual the motor and mental are probably conjoined in a measure, but in the beginning the motor part has a sort of initial and coercive power, which it loses as maturity is approached. The ends of existence, in the early years, are of a motor character; the young are interested principally in those things which require motor effort to attain." From such authoritative statements as these, and from our own observation of children, we have abundant reason for believing that it is in the elementary school that manual training is of superior value as a factor in general education.

2. If one has ever watched a child grow and develop from month to month and year to year, entering into his life and experiences, sharing his joys and sorrows, such a one will need no argument from psychologist or paidologist or physiologist to prove to him that in

manual-training work there should be a minimum of technicalities in the lower grades and that the maximum should be reserved for the upper grades. The spirit and character of the work of the lower grades must be in accord with the interests and capabilities of the children in those grades, and these change as the children advance from grade to grade. The mind of the young child seeks animated wholes and is not appealed to by "isolated details of form or structure." It is the "go" of the windmill that satisfies him, not its construction; while in later years his chief interest is likely to be in working out its parts in such a way as to most perfectly utilize the driving force of the wind. This suggests the importance of having the pieces of work to be done in the lower grades free from annoying technicalities and of having the child's pathway as direct as possible to the result he desires to attain.

Nor will this freedom from undue technicalities and directness in method of working in any way interfere with the progressive acquirement of skill in the use of tools. The development of skill for its own sake does not belong to the manual-training school, but to the trade school, and least of all does it belong to the manual-training work of the lowest grade in elementary schools. On the other hand, skill as an educational means should not be underrated in manual-training work; it should be encouraged in every legitimate way. Every piece of work should be done well — as well as the pupil can do it — and good habits and workmanlike methods in the use of tools should always be encouraged. I am yet to learn of any possible justification of the slovenly, haphazard, demoralizing work that is sometimes labeled manual training. Do not misunderstand me. Work that is crude to our experienced eyes may be — sometimes is — excellent from the standpoint of the child; I would not condemn such work. But unless I were quite sure that it is such, I would not only ask the question, "Does it represent the pupil's maximum of interest and his best effort?" but also the questions, "Was the pupil interested in the best thing? Were the suggestions of the teacher wise ones? Was there nothing better for him to do at this particular time? Could not the child have been surrounded with such influences that he would have taken just as much interest in doing — even have chosen to do something else that would not have been, in the nature of things, beyond his ability to do well, and the doing of which and the results of which would have given him keener satisfaction, and at the same time have elevated his standard of workmanship?" We sometimes talk about having the

child choose what he pleases, according to his nature, but we all know very well that it is the regular business of the school to influence the choices of its pupils. We could not eliminate the personal influence of the teacher or of fellow-pupils or of the school building if we would, and we would not if we could. To nullify the influence of the teacher would be to repudiate the fundamental idea of the kindergarten — the development of character by means of organized and directed self-activity. With the coil of rope in our hands shall we restrain our impulse to save the drowning man because, by choosing, per force, to swim unaided he would pursue a more natural method of saving himself?

I merely confirm the experience of many when I say that children, as well as their elders, like to do things they can do well, and they become discouraged and careless when they find they have chosen to do — and more certainly when they have been commanded to do — something entirely beyond their ability to do well.

All this, however, does not lead to the further conclusion that a fixed course of models must be employed in teaching manual training in the lower grades. Far from it. Allowing a child to do only a particular one prescribed thing in manual training at a certain stage in his progress, and treating all children alike, may be just as bad as letting each do whatever he pleases without let or hindrance. Both are bad; it makes little difference which is worse. Neither is better. The only rational conclusion is that in manual-training work, as in all other school work, the child should be wisely guided by the teacher with due respect to his individuality. Nothing short of the very best he can do in the best possible direction should satisfy either pupil or teacher.

3. While the child is in the primary grades his constructive work should be connected with or grow out of his activities at home, at play, or in the school. I need not suggest that the school life should be connected with the home life, but I will suggest that the constructive work should not all be connected with the school or all with the home, but that it should connect with both and, in the earlier years, perhaps especially with play. Such work may be one of the strongest ties to bind together the too often separate elements in the child's social life.

As in the earlier years the constructive work may be connected with play, so in later years, when the play broadens and develops into more serious investigation and experiment with the forces of nature, the constructive work may take the form of experimental apparatus, interesting devices, and "home hobbies." Throughout the entire course

household conveniences and objects of beauty for the home and the school should find a place in constructive work.

Shall constructive work be correlated with geography, arithmetic, language, and history? Yes and no. No, if you mean by correlation distorting both subjects for the sake of correlation — harnessing up an ox and a race-horse for the sake of having a team. Yes, if you mean making use of every natural and reasonable opportunity to allow one subject to assist or illuminate another. Professor John Dewey has recently said: "It is the community and continuity of the subject-matter that organizes, that correlates; correlation is not through devices of instruction which the teacher employs in tying together things in themselves disconnected."

4. Looking now at our subject from the point of view of practice, the first question that seems to meet us is: "How shall the course of instruction in constructive work be formulated?" If it is not to be a rigid course — a fixed series of models — determined by the teacher, and if it is not to be a "go as you please" with tools determined by the pupil, just what is it to be? It would not be very difficult to formulate a rigid course to fit the average pupil if we could only get a few specimens of the average pupil precisely alike to experiment on; but even if these were obtainable, it is obvious that the resulting formulated course would not fit the other pupils in the same class, and therefore would be of little value comparatively. If the pupil always determines what he makes without the advice of his teacher, the question of formulation is reduced to zero, and likewise, often, the educational value of the constructive work.

What must be done is to formulate the various courses in manual training in such a way as to insure the giving of the fundamental elements in such training — not to the mythical average pupil, but to all pupils within some practical range of manual ability. By this I mean such a range as is represented by a grade in the public schools. Each course must be flexible enough to suit, not only individual abilities, but individual tastes and interests. Certainly this is not too much to ask of manual training, for you are doing the same thing in other school subjects. In history you no longer demand that each pupil merely memorize the paragraphs in his text-book. You omit most of the memorizing and stimulate outside reading and discussion; you *expect* that one pupil will know more facts of history than another and get more mental discipline out of the course. You take into consideration individual interests and tastes, utilizing them to the best advantage.

You do all this and yet keep to your subject chapter by chapter. You expect that every pupil in a class will get certain more or less definite elements of knowledge and training while studying a given chapter in your course, yet beyond this minimum limit there is the greatest and most delightful freedom. You secure unity in acquisition, yet diversity of attainment — liberty under law, which is the most perfect freedom.

If this is true in the teaching of history, why may it not be true in manual training? By analogy, in order to formulate a course in manual training it is essential that certain fundamental elements of subject-matter, or things to do, be selected in accordance with the nature of the kind of constructive work undertaken — not dictated by physics or nature study or some other subject in correlation with the manual training. The writer of a text-book on general history, so-called, selects his subject-matter and divides it into chapters in the way he thinks will enable him best to present the facts of general history to the pupils who are to use his book, not so as best to correlate with some book on literature, or art, or government. If his facts were arranged with reference to the development of literature, his book would likely become, not a book on general history, but a history of literature; if of art, a history of art; if of government, a history of government. If, then, we are going to teach manual training and not the manual training of history, as such, and the manual training of physiography, and botany, and mathematics, and every other subject, we must have certain fundamental elements of subject-matter — things to do — determined and arranged from the point of view of the manual training itself. After this has been done, we may and should correlate the manual training with the other school subjects.

As no attempt is ever made in school work to cover all the facts of history bearing on a given period, so no attempt is ever made in manual training to cover all the methods and processes of a given kind of work; for instance, no teacher of manual training ever would think of teaching all that might be taught in wood-working. In history there is always a broad field of supplementary reading for those whose interests lead them in the direction of art or of government or of industrial development, and optional work is often arranged for. So in manual training there should always be a wide range of possible work which shall give ample scope for choice, invention, and decoration.

We may now summarize as follows: (*a*) Manual training has its greatest work to do in the elementary schools. (*b*) In whatever grade it

is taught it must be in accord with the native interests, tastes, and abilities of the individual children in that grade. (*c*) Skill of hand as an educational means should be unceasingly cultivated. (*d*) The cultivation of such skill does not demand the following of a rigid course of instruction; the end may be accomplished better by a flexible course which adapts itself to individual interests and tastes, and is surer of calling forth the pupils' best efforts. (*e*) Constructive work should be organized and formulated with reference to fundamental subject-matter elements within itself, not primarily with reference to the subject-matter of some other kind of school work. (*f*) Correlation with other subjects should come through natural, not artificial, points of contact or overlappings of subject-matter, or through the medium of the social life of the children.

A STUDY: MANUAL TRAINING FOR CITY CHILDREN.

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IT seems well to state at the outset that this short paper will deal directly with the practical side of the designing of the models. The main principles underlying the practical treatment are these: Manual training recognizes the fact that growth comes only through exercise. It develops the powers of receptivity, adaptability, initiative, and action by laying their true foundation in the active use of the senses and by demanding for their normal growth the appropriate functioning of the whole mind. Also, through dealing with activities that are social, manual training gives these powers their true values.

We see in the first place that they must be adapted to the varied interests of the child in the social whole. These objects must not only be of use, but their use must be seen and appreciated by the pupil. They must be within his capacity, for, while they must demand effort on his part to be of value, they must also be within his power of accomplishment. As they inculcate true proportion and form, the child will grow to desire the more beautiful.

Manual-training models built upon the principle of interest and use were first evolved for the country or small town. In bringing this work into our city schools, it was taken as a whole, principles, models, and tools. In the series of models, therefore, we may observe many that do not appeal to the city boy.

The problem being to design this course of models for the city children who are surrounded by home influences, we must differentiate the interests of such a class and the interests of those whose life is either not in the city or who are living in the city among starved surroundings and have not the influence of the good and comfortable home. By this differentiation we may determine where the interests of those for whom we are working lie and then meet their requirements.

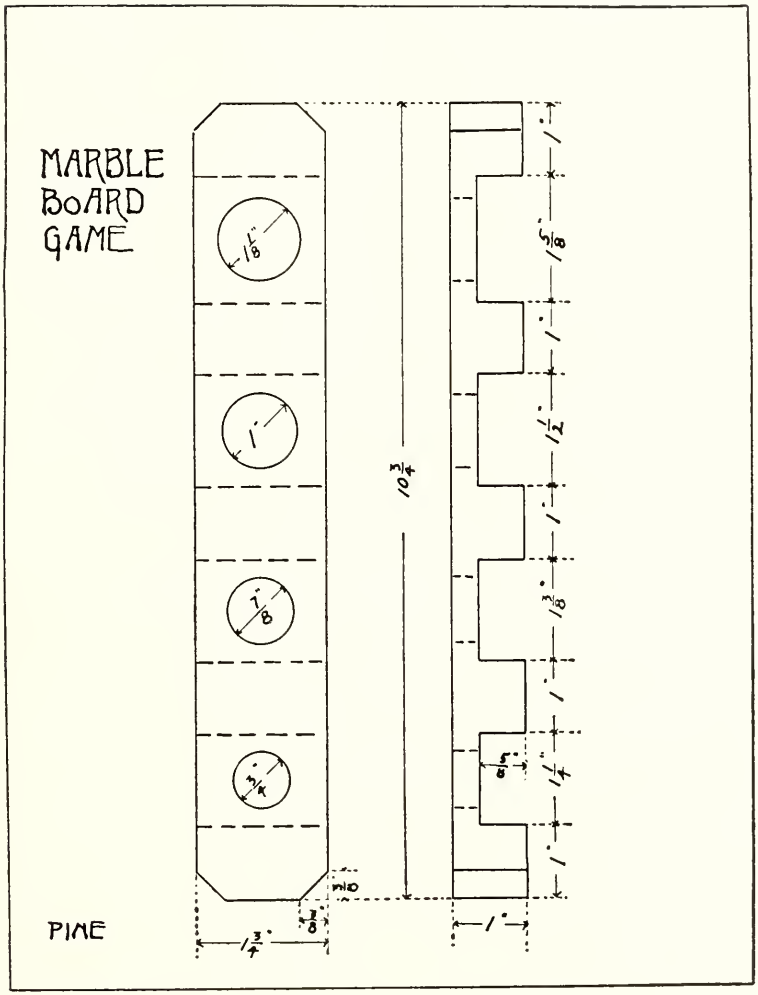
Is there a difference between the interests of the city boy and the country boy? Their education, in both cases, only a small part of which is given in the school, has been the adjustment of the boy to his environment. The life of the city boy has been in walled-in streets,

stifled air, the hurry and change in the midst of the handiwork of man, and of many things to be guarded against. The life of the country boy has been in the largeness and freeness of nature, something of greater value the nearer he is drawn to it. City life is a growth under restraint in many lines in which country life is a growth without restraint. Must this difference not lead to dissimilarity in their interests?

How does the boy evolve his interests? He is certainly drawn to those things nearest to his own nature; things become more to him the more familiar he is with them. The process of realizing his interests is one of evolution. In the very young the most interesting things are those which give the most pleasing physical sensations; the very young child knows no other. The greater the field of sensation developed, the larger will be the number of points of contact with the outer world, and the more easily will he evolve many desires and interests. As the child becomes aware of the cause of his pleasurable sensations, his interests will be transferred to this agent, but external interests are built up through sensations only.

The city boy is so surrounded by changing conditions that his mind becomes more alert to receive impressions, but at the same time there is such a mass of impressions ever presenting themselves to his consciousness that he is not liable to fix his mind on any one of them, and gets into the habit of letting them pass unobserved. The country boy, surrounded by nature where he sees slower change and fewer objects, can more easily follow what he observes. This would create a habit of observing and careful following. The city boy is liable to receive a multitude of sensations and still not retain them clearly and distinctly. The duty of the school, then, in the beginning is to give him sensations through as many organs as possible at one time, but to have these sensations so related that he will receive a unified impression which may become fixed in his mind. Such a method may not only counteract the shifting, changing influences of the city life, but will obtain relations between activities as well as things.

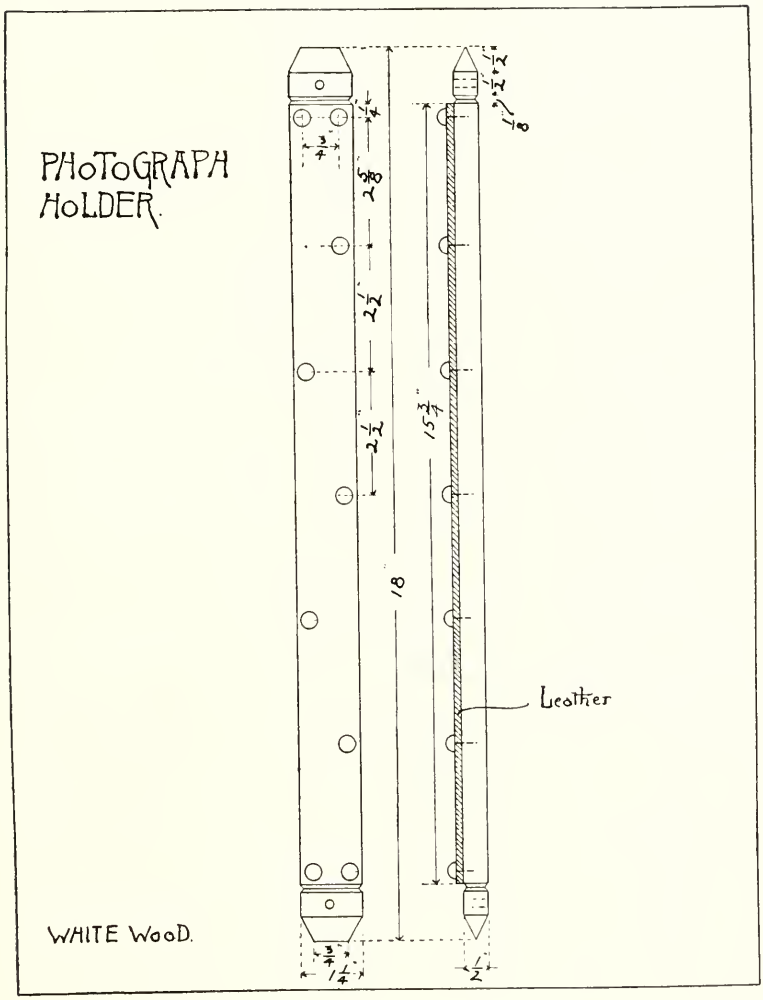
By dealing with objects themselves the child has an advantage over learning about objects from the books, for the thing reaches him in several ways and directly. Where is the place from which the boy is to receive the most pleasant sensations and evolve his strongest interests? Among all classes, and particularly among the cultivated class, it will be found in the home. The home life of the country boy is, however, in many respects different from that of the city boy. The


MARBLE
BOARD
GAME
PINE

country boy is surrounded by the open fields, which are the sustenance of the family, demand the father's time, and which provide work or play for his own time out of school. His activities may have full play. What are here all combined in his home life are in the city distinct lines of activities, usually far apart. The country boy may be at home when in the house, the fields, the woods, or the barns. As a direct outcome of these observations it is not surprising to find that many of the Swedish sloyd models, based upon the interests of the peasant life, belong to the fields and the barns.

The home we are to deal with is a different one and is closely centered about the life in the house itself. The city boy's greatest interest should be in this home life ; a love for the cheerful atmosphere of the whole, and a desire to help maintain it. He will then desire to please and to be pleased. Any task that contributes to anything in the make-up of the home, and does not discord with anything there, will bring pleasure to someone and a pleasant return to the doer. It may be said that many homes have not the atmosphere that may draw the child's greatest interest to them. If this is not true, it should be so, and may the school not have an influence toward making it so? Should not the whole life of the boy, play and school as well, center about the home? If it did, should we not have the schools teaching live subjects, being social and moral institutions in very fact, thus doing their social duty? To design our course of models, then, to hold the interest of the city boys, we must design many of them to go into the indoor family life.

Another field of activity and pleasure, and therefore of interest to the boy, is his play-life. We have said that the play-life should center about the home, and yet how little does the average home take the initiative in the play-life of its children, though the playground is as great an instructor as the school! A great part of the play-life must be in the open air, if we are to have a healthy child. Health ought to be that which is most desired in the child, for without the healthy body we cannot develop the strong and healthy mind. The surroundings make a great difference in the play-life of the city and the country boy. The hothouse life of the city drives the city boy through a swifter but less vigorous growth. He goes through the kite and marble stage earlier than the country boy. The nature of his surroundings also makes the city boy more accustomed always to be with others and feel the need of play that brings him in contact with play-fellows. The fact that the city boy has so many toys given him also helps to develop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HOLDER.
3/4
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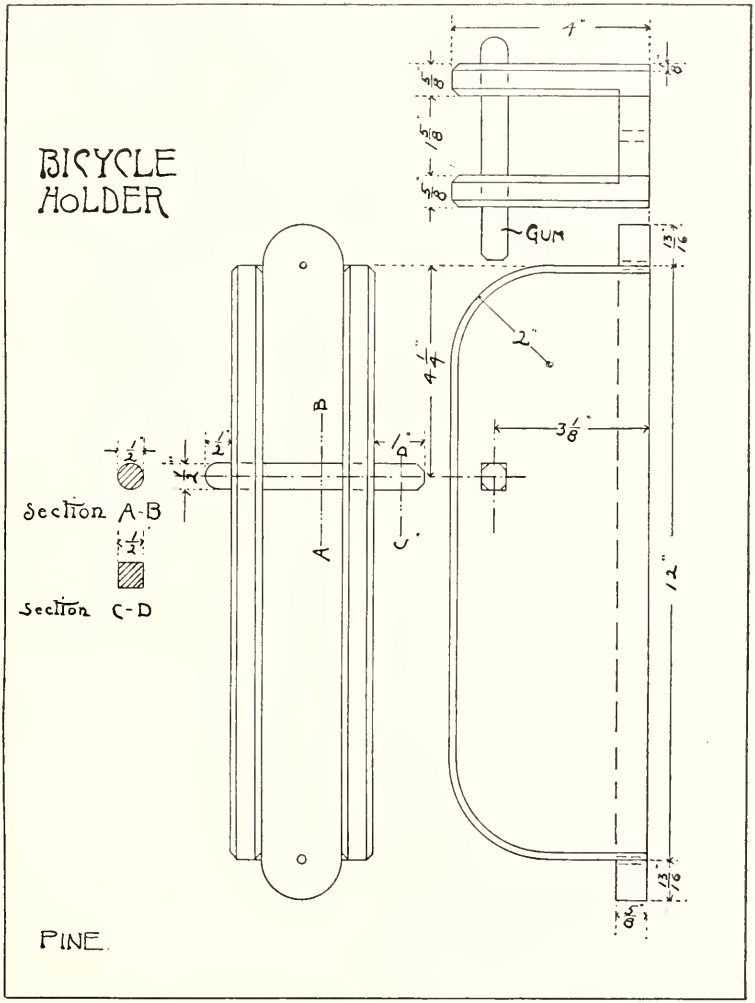
Leather
WHITE WOOD.
3/4
1 1/4
1/2

that desire for rapid change, something new and something admired by others. What have the home, the school, the church, done for the play-life of the children? Must we not make an effort to supply the children with amusement that is good, if we are not to compel them always to hunt for their own play, which in the street life of the city is always so close to that which may not be good? The school may direct much of the play of the children and develop play interests that may have a force outside of the school grounds. The thing to strive after is that, if the child is compelled to play in the street, his interest may be centered in the play and not in his surroundings. A model that the boy could use in his play might be a double incentive to keep his mind away from the street, for he would have the pleasure of the play and also have in his mind the fact that he was playing with that which he himself had made.

Another field of the child's activities is his school life. The pupil may be more interested in one study than another, but that is the result of its being nearer akin to his interests outside of the school. In our manual training we need not go to the other school subjects for models that manual training may become related to them, but we should go to the child's life as a whole and its deep interests, and if the other school studies do the same, they must all as a result be related to each other.

Having decided that the strongest interests should be in the home, and that the other interests would be stronger and better as related to the home, let us examine how the models may give these interests their true social and ethical value. Whatever the child may make that will be of use to others in the home will be of social service. Whatever he may make for himself that may be used in doing a kindness to others, or, in fact, anything that will contribute to his life and will not break into the harmony of the home, is an object of social value, and in making it he is doing a social act. In the school, where he is in contact with others and his conduct is directed, we have one of the best places to acquire a right social spirit, and how better can this be accomplished than, when working with others, he realizes he is making something of social value?

There is also involved the great social factor of labor and the laborer. The country boy has many kinds of work to occupy his spare time and many opportunities of enjoying himself in making and fixing things. With the city boy we have not this free opportunity to do and to make, and there has come a dislike for physical labor and the


BICYCLE
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4 1/4"
3 1/8"
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1/2
B
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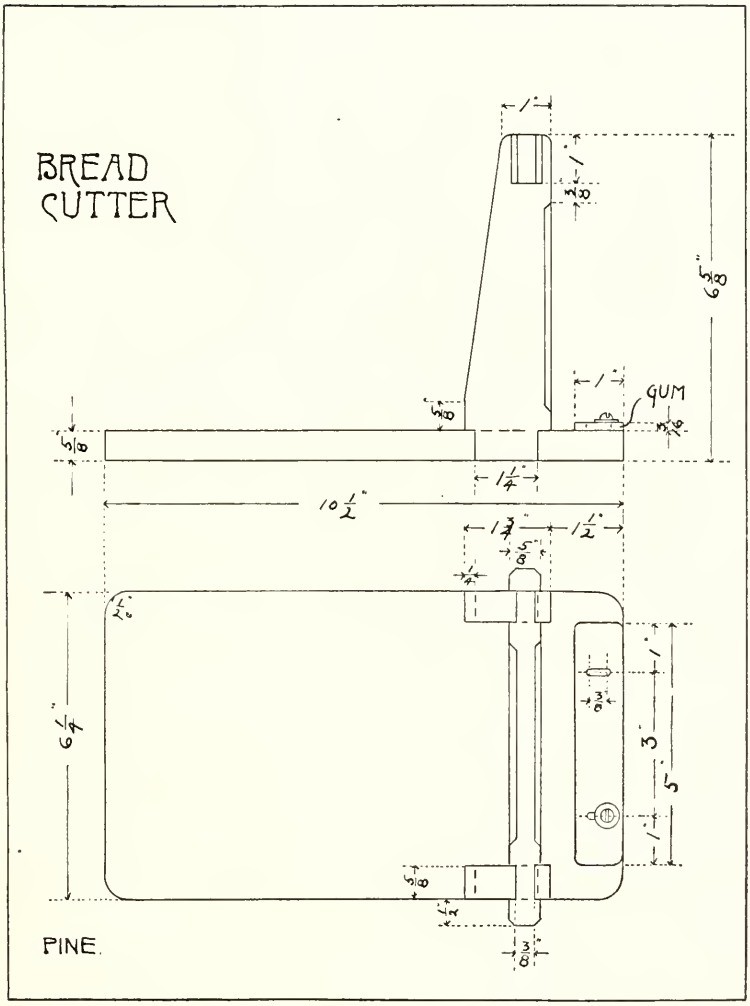
D
Section A-B
Section C-D
PINE.

laborer quite pronounced. The skilled labor that we used to boast of is now found abroad. Could we have a better factor to instill respect for labor and the laborer than working with others on objects that are interesting and of value outside of the self? We do not have to watch the city schoolboy with his legs twined about his chair or see him kick every small object he sees upon the sidewalk, without being conscious of observing a nature rebelling against inactivity. Can we think of nature under restraint all the time and wonder why it is petulant, easily excited, and irreverent? If the child cannot act in making, he is very liable to act in breaking.

One of the worst traits of the city boy is his irreverence. The fault, I am afraid, is not so much in the boy as in his environment. The school in intellectual lines appears to him to advance faster than the home, and children often begin to think they know more than their parents. The school should recognize the close connection between the home and the school as a social and moral rather than an intellectual one, and lead the children to respect it. The child's interests in the home should not be selfish ones. He must make things in his manual-training work that will bring pleasure to others. If we can make the connection between the home and the school a happy one by the pupil's looking to the interests of others, are we not doing right in creating a habit which will give pleasure?

The manual-training models must be interesting, and we have discussed the interests of the boy, but there is another point of adjustment between the child and his work that is just as vital. The model must be within the capacity of the child. Is there a different standard here for the city and the country boy? In the city we see the more nervous and sensitive nature which wants to do all at once; to rush it through and then on to something new. The city boy has less desire for continued effort. The manual-training models for the city boy must not require long-continued effort at first, but gradually increase the persistence and patience required, that he may build upon accomplishment to longer-continued effort.

We must examine the two boys also from the æsthetic side. With the country boy an object complete in itself will take its place among the other objects of the home as a rule, without detracting from the beauty of the whole. With the city boy, who lives in surroundings that are less simple and sometimes elegant and harmonious, the element of agreement requires special study. The model must not only be


BREAD
CUTTER
GUM
PINE.

finished and of artistic form, but must also be so finished that it does not mar the harmony already in the home.

Manual training will develop the powers of the child through spontaneous self-activity, if the models the child makes are adjusted to his capacity, and so based upon his interests as to draw upon his energies. Through these interests the child not only has more points of contact with his environment, and thus more easily adjusts himself to it, but also helps create a definite and true environment. The work is not only based entirely upon the child and his interests, but through them it endeavors to create new and higher interests. Finally, manual training thus carefully adjusted will give a mental reaction that is ethical, bringing about a definite largeness of life, and approaching nearer to complete living.

NOTE.—We have space for only four of the drawings accompanying this article. The names of those not published are as follows: quoit stick, coat hanger, glove stretcher, plate rack, umbrella rack, bottle rack, book rest, and whiskbroom holder.—EDITOR.

LEAF FORMS OF OUR COMMON BROAD-LEAVED TREES.

EDWIN W. FOSTER,
Manual Training High School, Brooklyn, New York.

ALONG with the well understood and universally acknowledged tendency to concentration of our population in densely settled cities have appeared certain corresponding phenomena, social and otherwise.

One of these which often appears to the manual-training teacher in woodwork, and which never fails to surprise him, is the dense ignorance of the average city boy in regard to tree and vegetable life in general.

Of course this lack of knowledge of tree life appeals to the teacher of woodwork most strongly because it is a study to which he has given much thought.

To have stated a generation ago that out of several classes of boys, each containing thirty students, not one could distinguish a chestnut tree or had the slightest idea as to how it differed from other trees, would have been an invitation to ridicule and incredulity. Yet this

has been a common experience of the writer in teaching boys of Greater New York.

To the teacher presenting this query and receiving such a response, come the sounds of rustling leaves, merry shouts and peals of laughter, as in imagination he is carried back to the crisp autumn days on the farm, when the firm brown nuts were of more value than all the gold of the Klondike; and to the bottom of his heart he pities the group of poor dwarfed city youth who have never known the joy of such experiences and who listen to his description with bright and hungry eyes.

No matter how limited may be the time allowed for woodwork, that portion is well spent which is devoted to the discussion of trees, their leaves, bark, and general appearance, their uses and great value in the arts and industries, their utility collectively as forests, with the great questions of forest influence on the source and flow of rivers, etc.

Gradually it will be found that the class as a whole contains a considerable amount of tree knowledge. John, who lives down on Third avenue, remembers that he was in the country one summer and can hardly contain himself until allowed to tell the teacher and class of some of his experiences with trees; this reminds another boy of a magnificent elm which grows in the front yard of a relative in New England; the enthusiasm becomes contagious, and with this hold on his class the teacher has but to announce at any time during the course that they will stop work for a few moments to talk a little more on the subject of trees, to insure such an attentive and appreciative audience as would delight the heart of the most sensitive lecturer.

Then if the teacher can supplement these talks, which should be illustrated by leaves, wood sections, etc., by trips to the parks and natural history museums, he will have given the boys a real gift, the ability to enjoy what, to many people, is a commonplace and totally uninteresting subject.

Many instructors do not do this, perhaps largely from lack of knowledge and the love of nature, and certainly a teacher cannot impart to his student that which he does not himself possess.

Perhaps one of the best ways to produce the initial interest in this subject is to show the class two widely different leaves, such as the catalpa and honey locust.

If these can be mounted on bristol board or heavy drawing paper, their difference in form will show more clearly, perhaps, than in the

natural state. Having related briefly a few facts regarding the two trees and the boys will immediately be interested in the catalpa, because of the long beans it produces, and the honey locust on account

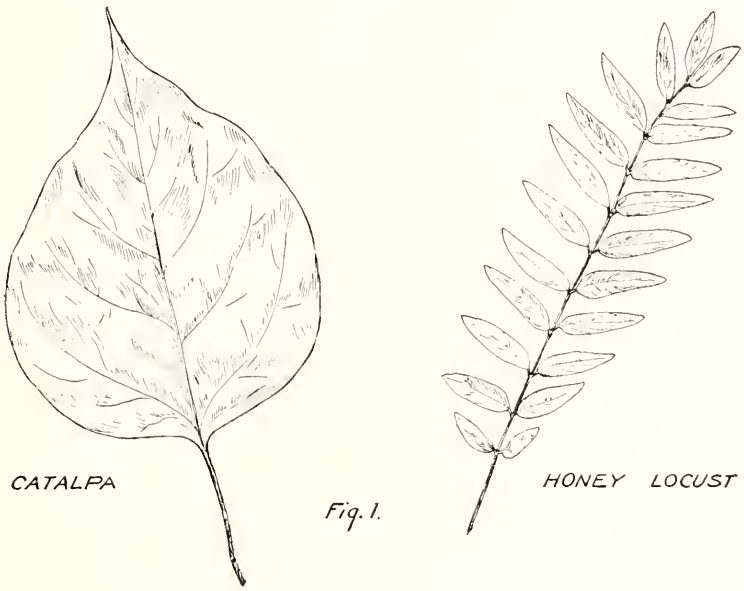


Fig. 1.

of its murderous looking thorns—the instructor may inquire in a casual way if there is any liklihood of the two trees ever being confounded. He may then proceed to point out how a little study will prove that no two trees have the same shaped leaves and that the differences although not always so strongly marked as between the catalpa and honey locust, are still so great as to make errors hardly excusable.

Following this it is well to show two leaves which might be confounded by the superficial observer, such as the chestnut and chestnut oak.

The difference in the proportions and especially of the indentations which are distinguishing features, should be dwelt upon.

At this point it is well to warn students that individual leaves are often misleading, and that the "typical leaf" is always to be looked for. The instructor, of course, must be careful in making his collection or in his illustrations on blackboard or lantern slide, to present

the typical leaf form, and to point out the character of the tree as expressed in its bark, color, and general form.

CHESTNUT

CHESTNUT OAK

Fig. 2

The family of oaks offers a splendid field for a series of short talks, and follows naturally after the mention of the chestnut oak.

WHITE OAK

Fig. 3.

RED OAK

SCARLET OAK

PIN OAK

Fig 4

The ease with which the different members of this family can be distinguished may be illustrated by presenting the leaves of the white and red oaks.

Then, while enlarging on the sterling qualities of the oak both as a sturdy, vigorous tree, and, later, as timber so reliable that it has been

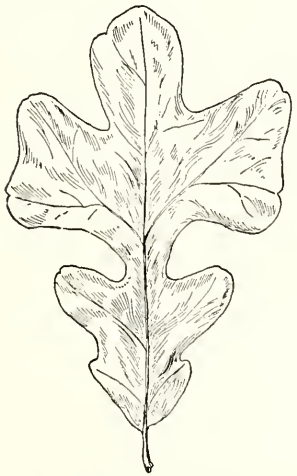


Fig. 5. POST OAK

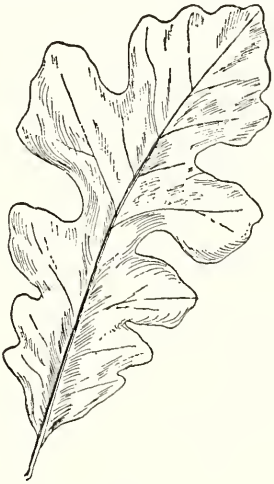
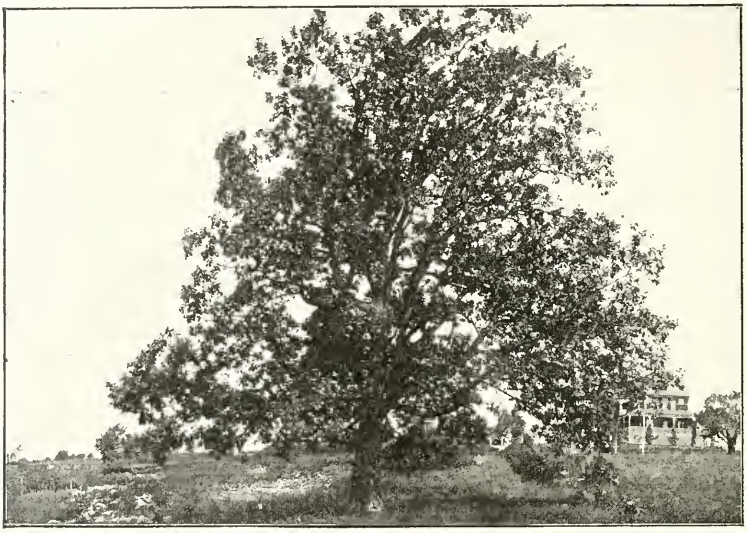


Fig. 6. MOSSY CUP OAK

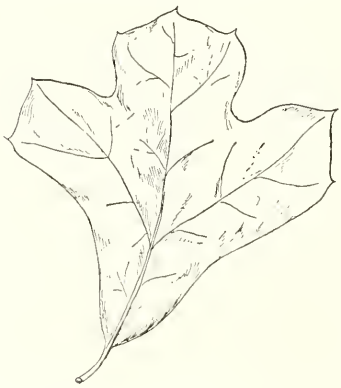
adopted as the standard for strength and durability in timber calculations, the two somewhat similar leaves of the scarlet and pin oaks may



WHITE OAK

be shown and the differences pointed out, that of the scarlet oak being larger and having deeper indentations, "the pin oak taking its name from the pinlike appearance of the little branchlets which are set in the limbs and trunk."

BLACK OAK



BLACK JACK OAK

Fig. 7.

The post oak with its thick, dark green leaves may be distinguished easily from the white oak, whose leaf it somewhat resembles in form, by its color, the peculiar manner in which the leaves clothe every limb from the trunk out to the extreme tip, and by the leaf itself, which tapers rapidly from the two main lobes to the stem,

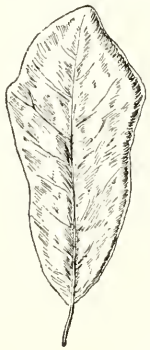


Fig. 8 LIVE OAK

This is one of our most artistic leaves, and one which is much neglected. Right at this point allow me to hint to the teachers of wood carving that the English oak and its acorns have had their full share of attention; there is a wealth of material in our American forests which has been too long neglected. For instance, what could be more beautiful than the leaf of the "mossy cup oak" with its ten or twelves inches of generous length and its solitary acorn whose kernel is all but hidden by its heavy fringe. F. Schuyler Mathews speaks of it as a tree growing under favorable circumstances to a height of 175 feet, and as being not excelled in graceful beauty when not crowded in growth, but left free to follow the law of its development.

PIN OAK

The black oak and black jack oak are common enough and different enough to interest every boy, and the live oak, although a southern tree, is remarkable not only for the simple dark green leaf, but for its extremely heavy and strong timber, formerly so valuable in ship building, before iron and steel began to play so important a part in construction.

In the articles to follow no attempt will be made in the nature of scientific classification, but such contrasts and differences will be pointed out as will enable any high-school or grammar-school boy to distinguish our common American trees without difficulty or error.

BACKWARD BOYS.

GEORGE B. KILBON,
Springfield, Mass.

THE backward boy often chances to be a boy in whom the mechanical instinct is strong. He is not like his studious play-fellows who are happiest when poring over books; our backward friend loves books but little, yet give him a sharp tool and he feels at home. To tell him that tool-using is a groveling employment, and urge him to aspire to something noble does no good. You only puzzle him, for tools to him are the noblest thing in the world. Were not the great buildings he sees around him, and the wonderful machinery whose mechanism he never tires of studying, all made with tools, and did not the Omnipotent Creator use tools of some kind to fashion the universe and to carve out the orbits in which its spheres should travel? "Hath not My hand made all these things?" No, you might as well talk to a stone as to address him with advice which assumes that books are to be studied at the expense of tools. He gradually becomes stunted in mental development, because he is denied the culture necessary to growth in his particular case.

It is conceded that at the age of fourteen years the average boy has attained a muscular development sufficient to warrant his handling tools and being instructed therein, but in the centralization of our thought upon mental culture we have unwittingly confined the privilege of tool instruction to those boys of fourteen years or older who have gained high-school admission. This plan certainly neglects some who need the benefits of manual training, and whose lives will be spent in employments where training in the use of tools would be put to practical use.

It is well known that there are in our schools boys of fourteen years in grades as low as the fifth, and even the fourth. In a canvass I made at one time of the Springfield schools I found over three hundred boys of fourteen years in grades below the eighth, while at the same time the eighth and ninth grades together, which were receiving one lesson a week in carpentry, numbered only about three hundred. The thought has impressed itself upon me with much force for a long time that these three hundred backward boys should have some

manual privileges offered them different from anything at present provided, and of a nature suited to their especial need. Their mental *attainment* will not allow of their being classed with high-school boys, but their mental *capacity* should not allow their being classed with fourth to seventh-grade boys. Their manual taste and capacity would class them with mechanic-arts high-school boys, and they would not only hold their own with them, but would, in many cases, distance them. Surely their peculiar needs have a claim on our attention, and should be provided for. The object of this article is to suggest a plan for such provision in the hope that others who are thinking along the same lines may give the plan general approval, and assist in creating a sentiment in favor of its adoption, or may discover and present an improved plan which shall win favor and so succeed.

The plan is to establish a grammar manual-training school in every city, to which shall be admitted all boys who, on arriving at the age of fourteen years, shall elect to enter. The equipment of the school shall be equal to that of the mechanic-arts high school in respect to its drawing and varied tool instruction. The academic curriculum must be superior to that of the low grades from which the boys have been transferred, but cannot be equivalent to high-school curricula; yet each boy must be well grounded in the three R's, and he should be instructed in the duties of citizenship. The history of his own country should be learned, and that of others, if possible, and such elementary facts of science should be acquired as there is time and capacity for. The chief aim should be to fit boys for mechanical industry. If, in pursuing the course, some are fortunately aroused and spurred by their own ambition to enter advanced schools and make a life record for themselves in other lines of human effort, the fact would be but a demonstration in one line of the wisdom of the enterprise.

The academic side of it would add no burden to any city, for it would simply be removing pupils from one school building to another, unless, indeed, it kept many boys in school who otherwise would leave, and in that case any city would cheerfully assume the burden. The manual side of it might not add expense in cities already supplied with mechanic-arts schools if the equipment of these schools could be utilized at such hours of the day as they would otherwise be idle.

Where is the city that appreciates this need sufficiently to be disposed to undertake the experiment of trying to supply it, and of demonstrating its feasibility and utility?

ASSOCIATIONS.

DOMESTIC SCIENCE ASSOCIATIONS IN ILLINOIS.

DOMESTIC economy in Illinois seems to have taken a firm hold upon the people, and the outlook now is most encouraging towards seeing it a part of the regular school work of the state. The matter of better food, better home-making, and more thought along the lines of personal living, seems to have a place in the thought of the women of Illinois in a way that is most gratifying to those who earnestly believe that one of the strongest factors in growth of character, of brain, and of body, must come from the physical side of living.

Two years ago last February, when the State Farmer's Institute met at Champaign, Ill., some of the most earnest women in the state organized a Domestic Science Association. Mrs. Carter, of Champaign, was chosen president, Mrs. Emma J. Davenport, of Urbana, secretary. There was little else done, and during the first year the growth was slow, but at the time of the first annual meeting, which was held at Princeton, in February of 1899, the enthusiastic reception of the news that many counties of the state had organized domestic science associations, and that some of the counties had found it necessary to organize township associations, gave a new impetus to the work and filled with joy the hearts of the few women who had started this association. The work had been almost entirely in the hands of Mrs. Carter and Mrs. Davenport. They had sent out circulars and tried to interest the women whom they knew in various parts of the state, and now were beginning to reap their reward, because of the growth of interest in this branch of work.

At the second annual meeting, held at Mt. Vernon last February, the secretary reported fifty-one counties organized, and from many of these there came a definite report from the county association, given in some cases by a member present, sent in other cases by a delegate, who unable to be present herself, could not miss having her county represented. At this same meeting a large number of these counties reported several of the townships inside their borders organized, and a few counties reported nearly all the townships belonging to them as having a special township organization for the study of domestic science. This means to most of these women a gathering together of neighborhood friends, once in two weeks, or once a month, at the home of one of their members, where topics relating to homes and their betterment, their growth, and especially to the food eaten in those homes, are discussed; and sometimes these women, in addition to discussing the theories of the practical questions of the day, bring right into their meeting a practical working out of certain questions. For instance, one of the associations has its every alternate meeting a practice meeting, and a meal is prepared, served, and eaten under the direction of one of the members, who herself talks in a most interesting manner of the chemical composition and the food values of many of the articles cooked.

Some of these associations have reached out and have helped the teachers in their community to begin something toward teaching domestic economy in the schools.

One woman has herself helped in the actual work, spending one afternoon each week in her own district school, where she goes and teaches the little girls to sew. Other women have gathered the children of the neighborhood on Saturday afternoon, and organized a little sewing class or a class in cooking. Others still have worked earnestly enough in their own town to succeed in convincing the school boards of the desirability of domestic economy in the public schools, and in consequence we have quite a number of these schools either with domestic economy already commenced, or with definite work started toward accomplishing that end in the coming school year.

These associations cost the time and thought which every woman puts on her paper, and of course there is much earnest thinking done by the executive board while making up the program for the year's work. As to cost in money, there has been none except in cases where the club subscribes for a magazine or buys a book. The state association is largely supported by the State Farmer's Institute, but the work is all carried on by women who are interested to see more thought spent on the homes of Illinois.

A farmer's institute which meets in every county of the state once a year, sets apart either an evening or an afternoon for work in domestic economy. There are several women in the state who go to these institutes, telling of the work of their home domestic science associations and helping to organize new associations. Mrs. Dunlap, of Savoy, wife of one of the most influential senators of Illinois, has done excellent work all through the state in this line, and has raised the standard of thought about home-making by her earnest talks upon the responsibility which comes to the woman who carries on the home. Several other strong women who are home-keepers spend time and strength and energy on this work every winter, and one teacher of domestic economy in this state, Mrs. Kedzie, of Bradley Institute, has, during the last two years, spoken in forty-three county institutes, telling of the teaching of domestic economy in the school to which she belongs. This work covers several lines of study, and begins when a girl enters Bradley Institute from the grammar-school grade. During her first two years she takes an hour a day of sewing, and this sewing is intended to cover not only learning to make the stitches which are put into a sampler book, but learning something about cloth, its production, manufacture, sale, and special qualities, and many helpful facts about the materials which the world furnishes for making or adorning clothing. These are given through lectures. Then every girl learns to cut, fit, and make her own garments. When the two years are over, she has carried all her regular studies, such as she would have carried in any high school, and in addition she has the knowledge and deftness which enables her to make her own clothing, if necessary. The third year she may elect technical dressmaking if she will. During the fourth and fifth years she spends an hour a day upon foods, learning something of their production, preparation, serving, and values. She cooks at her table one hour a day for one year. She spends an hour per day for a year on the advanced work, such as canning and preserving fruits, marketing, serving meals, chemistry of foods, and diet studies. She then has a term of hygiene and household sanitation, putting into practice the knowledge she has acquired in the various lines of science which have come to her, year by year, through her other studies that are carried on at the same time she is carrying the domestic economy work.

The people of Illinois have been very ready to listen to such women as Mrs. Dunlap and Mrs. Kedzie, because they are ready to work out the problems of making better homes, if possible, year by year. The women's clubs have been interested as well as the farmer's institutes, and the interest has developed in two directions, one of which has been a demand for the teachers of domestic economy to come and tell of their work and why it should be put into the schools. Nine such women's clubs, in as many prominent cities of Illinois, have listened to Mrs. Kedzie's account of the work done in Bradley Institute, and some of the teachers in Chicago have been asked to speak on the same subject in several of the cities of the state.

The other line of work in which the women's clubs have been prominent is in putting this work into the public schools of their own towns. Some of the schools of the state have already begun to teach domestic economy. The Urbana public schools have a very comprehensive course of domestic economy, commencing in the lower grades with sewing, and giving to the older pupils something of cooking, until every child has a definite idea that sewing and food work are a part of every day's school duties. Moline has put this work into its public schools, and quite a number of cities are talking strongly of finding a place for teaching the children the practical things of life. The boys are given the manual-training work with tools, and the girls have sewing and food work, wherever the school board finds itself with money to do this work. Several of the towns are making strong efforts toward putting this into their schools next September, and there have been a large number of letters written to Bradley Institute about this work for public schools, asking about the cost of equipment, salary of teacher, time to be devoted to it, and all the questions that would naturally come to thoroughly interested people. Decatur has had an awakening because of the work of some of the interested women, who announced through the papers that the girls who wished to learn to sew might come to the Women's Club building on a certain Saturday afternoon. The women went prepared to meet possibly fifteen or twenty girls; judge of their astonishment when seventy-five girls appeared. On the second Saturday the teachers were greeted by one hundred and seventy-five pupils. The interest manifested has grown in a substantial form, and we understand that a gentleman of Decatur has come forward with an offer of $200,000, provided that the citizens of the town will raise $100,000 more, in order that a manual-training school may be established, with an endowment of $300,000. The Ladies' Club, of Mattoon, started a sewing school more than two years ago, and the interest has grown to be such a power that strong effort is being made to put, not only sewing, but cooking as well, into the beautiful new building Mattoon is putting up for her schools.

All these indications show that the trend of education is strongly toward the making of young people into useful citizens, and that the great mass of people are glad to see the schools take a practical turn. Every woman has need, during her lifetime, of the knowledge which will enable her to carry on a house. She has special need of the knowledge which will make her able to so care for her own body and the bodies of the people who may be dependent upon her, that they may become strong, healthy citizens. With the certainty that this knowledge will be needed, it is perfectly logical that every girl should have in her school training something which will help her to be ready for any work which may come into her hands. Every girl needs to have the mental training of the schools that she may think intelligently; she needs the hand training of the manual side of domestic economy — sewing and cooking — that she may work out her thoughts. With these two sides of education well

developed, we may consider that our schools are educating the great mass of girls so they will be women who are always a comfort to themselves, and useful, helpful citizens in the state. The growth of thought along domestic economy lines means that our girls are to be better educated. It means that the women are to do their work more easily and more effectively. K.

BOSTON MANUAL TRAINING CLUB.

REALIZING the benefits that may be derived from such organizations as the Masters' Club, and kindred societies, the men employed by the city of Boston as assistant instructors in woodworking, began to consider as long ago as last spring the advisability of forming some such association. No definite action was taken, however, toward permanent organization until fall, when at a meeting held on Saturday, September 23, 1899, the objects of such a club were discussed, lines of work suggested, and a committee appointed to draw up a constitution. During the next few meetings the organization was perfected, Mr. John C. Brodhead, of the Bennett School, Brighton, being elected president; Mr. Alexander Miller, of the Chapman School, East Boston, vice president; and Mr. Edward C. Emerson, of the Prince School, Boston, secretary and treasurer.

This club is a society composed of the men employed by the city of Boston as assistant instructors in woodworking, and such other men as may be especially interested in, or will aid in the advancement of manual training. It proposes to further this advancement as much as possible by raising the pedagogical standard of manual training, and by attracting the attention of the public more generally to the work and its results; also, to offer to its members opportunities for the investigation of all branches of this subject. With this end in view it intends to have on permanent exhibition in its rooms, photographs, and, where possible, actual models and working drawings of as many courses as may be obtained, in all branches of manual training, besides a collection of the literature connected with the subject. The club meets on the first Saturday in each month to listen to papers and discussions.

The real work of the society began with the November meeting, at which several interesting papers on "Supplementary Work" were read by the members. At this meeting Mr. Frank M. Leavitt, principal of the Boston Manual Training Schools, and Mr. Gustaf Larsson, principal of the Sloyd Training School, were offered the freedom of the club as members *ex officio*. In December Mr. Leavitt gave an informal and extremely interesting talk to the club, taking as his theme the qualities needed in a successful teacher of manual training. He ended by saying: "The characteristics of a successful teacher are a belief in the efficacy of his methods, confidence in the ability of his pupils, and a love of children." Mr. Larsson gave a talk at the February meeting which was full of valuable hints and practical suggestions. He emphasized the fact that the teacher should refrain from doing the pupil's work for him, as the boy should be able to feel that the effort is his own, but care should be taken not to carry this so far as to allow him to form bad habits.

The secretary will be pleased to correspond with any one who is interested in the advancement of manual training, and arrange for the exchange of pamplets, drawings, models, and so forth.

EDWARD C. EMERSON, Secretary.

NORTHERN ILLINOIS TEACHERS' ASSOCIATION.

PERHAPS no meeting of teachers in the United States during the school year 1899–1900 has been so fruitful for manual training as that of the Illinois Teachers' Association at Aurora, April 26, 27, 28. The general subject for discussion was "Industrial Training as a Factor in Education," and some phase of this subject was under discussion in all of the general sessions and most of the sectional meetings and round-table conferences. One could easily gain the impression that all the teachers present appreciated the value of manual training in education, and that they had just begun such work in their schools or were about to begin it. What made this impression all the more encouraging was the fact that most of those present were in no sense specialists in manual training; they were the regular teachers, principals, and superintendents in the northern cities and towns of Illinois. Before adjournment it was voted that the meeting had been the most effective in the history of the association. This was largely due to the unity of purpose in the program, so skillfully arranged by the executive committee. The association also passed the following resolution:

"We are heartily in sympathy with the idea running through the program of this meeting, and recognize the importance of the development of a course of construction work throughout the entire course of the public schools, and especially the importance of such work in the lower grades."

Mr. W. S. Mack, president of the board of education of Aurora, in his address of welcome, seemed also to voice the general opinion when he said:

"We say no local system of education deals justly with the pupils that ignores this training, because without constructive work with space materials the pupil is deprived of a most important means of discovering himself and expressing himself along the lines of race development. In other words, a large proportion of pupils are given otherwise only "half a show" during the school period, because the conventional school subjects or branches, to which we adhere so rigidly, do not reveal to the teacher or to the pupil himself the aptitudes and the powers of a large number, who are cruelly set down as dull, indifferent, or perverse, because their standing is estimated entirely by their interest and progress in these branches. On the other hand, if our system made it possible to know it, we should find powers of doing and creating through the exercise of eye and hand, just as deserving of recognition and credit, and just as deserving of consideration in estimating the pupils' school standing, as power awakened through any other school work, and perhaps more valuable to the individual in the life toward which the school should point."

With this as the prevailing opinion, every teacher was trying to discover the best practical means of bringing constructive work within the reach of the pupils of his own school.

The opening session was a superintendents' and principals' round-table meeting, of which Superintendent F. U. White, of Galva, was chairman. The first topic for discussion was "The Place and Value of Commercial Branches." The second, "The Relation of Drawing and Manual Training to Arithmetic, Language, and Geography." Discussion of the second topic was led by Professor Ira M. Carley, of Chicago Institute, who was followed by Superintendent A. C. Butler, of Kewanee. Mr. Carley illustrated what he said with reference to geography by a number of interesting color drawings made by children in the Chicago Normal School. Superintendent Butler failed to see much relation between manual training and geography, but thought

arithmetic to be very closely connected with manual training. Both speakers pointed out the value of manual training as an ally of language teaching.

At the first day session two papers were presented. The first by Mr. Charles A. Bennett, of Peoria, and the second by Mr. Robert M. Smith, Supervisor of Manual Training, Chicago. After setting forth the value of manual training and suggesting some desirable changes in the organization and methods of public schools, Mr. Smith said:

"A course of study in manual training for elementary schools must be simple in its methods, economical in its installment and operation, and the objects made must be of interest to the pupils. We cannot introduce all manual occupations into the school indiscriminately. We must take into consideration the physical strength and the bent of the child. It is necessary to make a judicious choice, and to remove from the domain of the school every kind of work which will produce results antagonistic to the principles of a good education. It is also important in primary education to grade the manual-training pupils according to their different stages of advancement. It would not be reasonable to ask the child of six years to work with the same materials and tools as the child of from ten to thirteen or fourteen years old in the higher grades. We are no less illogical if we force country schools, comprising one or two classes, to conform to the same program as the city schools which possess numerous and homogeneous divisions, and whose resources are less limited.

"I would suggest the following as a course of study for elementary schools in country towns and villages:

"Infant Schools or Kindergartens — lessons based on the Froebel method.

"Elementary Schools — primary and intermediate grades: continuation of the Froebel method, clay modeling, pasting of forms and decorating, pasting leaves of plants, paper folding, cardboard work and drawing.

"Elementary Schools — advanced grades: woodwork, combined with chip carving and drawing.

"Modeling ought to be taught at the beginning of the elementary course. There is no exercise better fitted to train the eye, to develop the dexterity of the hand, to help the fingers to attain the suppleness so necessary in the manual professions. In woodwork the hand and the fingers often play only a passive rôle, their dexterity is lessened by the tool which they guide. It is not so with modeling. The hand acts without an intermediate agent, and can show all the dexterity of which it is capable. The boasting tool requires the same suppleness in the fingers of the modeler as the brush in the hands of the artist and the pen in that of the writer. Modeling obliges the young workman to rely entirely on his own resources, and makes him contract habits of attention, application, and order by the continual modifications which he is required to produce and the different forms which he has to create. There is another result which is not to be despised and which can exercise a great influence. Modeling inspires in the child the taste for graceful forms, artistic inclinations, and delicate arrangements; in a word, it develops the esthetic sentiment."

Mr. Smith then discussed more in detail the work of modeling, drawing, pasting and paper folding, and closed his paper with the following brief discussion of woodworking:

"Manual training in wood consists in the fashioning either of detached elements, each representing a new technical difficulty, or in the construction of simple and useful objects of small size, necessitating gradually different operations. Exercises in

wood afford the most effective means for attaining the end of educative manual training, because it favors a methodical arrangement, from the simple to the complex.

"The first thing to be determined is: What exercises shall be included in a complete course? These, in my opinion, should consist of all fundamental processes in the conversion of lumber after it leaves the lumber yard. Secondly: in what order should these be taken? It is not necessarily the first process that is the simplest educationally, and therefore first in an educational course. On the answer to this the third point largely depends: What tools shall be insisted on and in what order? On this I simply remark that the tools should be strictly fundamental. I would admit no labor-saving tools, not even a bench hook, till toward the close of the course, for the use of such is in no sense educational. The fourth, and by far the most difficult, problem is: What series of models, if any, shall be selected to embody the three preceding points? This is the most difficult, because on it largely depends the length of the course. In regard to this large question I would not exclude a model on the ground that it is an article of luxury. I should simply require that the article be familiar. I would not hesitate to admit a music stand instead of some other exercise; the great point to see is that no exercise is neglected. In the earlier models it will not be difficult to arrive at practical uniformity, but as the series progresses more variety may be admitted, and a larger use of alternative models. Absolute uniformity is not congenial to American ideas, nor do I think it desirable, even if attainable.

"In conclusion I would insist that the instruction in manual training throughout all the grades should be given by the regular teacher as a part of the general education. This follows from the assumption that the manual instruction is an essential part of the general education. Where it is regarded as a special or a technical subject, there, as a rule, a mechanic will be employed to teach, whose ideal, at the best, will be to make his pupils skillful mechanics. And for teaching a trade such, no doubt, is the best possible method. But such teaching should be clearly distinguished in practice. The practice in our large cities of collecting the older boys into a special center for instruction in woodwork under a special teacher tends to encourage the confusion of ideas, and may lead to the evils of trade teaching. I recognize fully the practical reasons which have led to the formation of centers, and I believe that the training received is a valuable thing, but hold at the same time that the ideal is a workshop — not so well equipped, perhaps — attached to each school, where the pupils can be instructed by their own teachers. This ideal is difficult to attain, but not impossible, and should guide the steps we take to encourage general manual instruction in the country towns and villages."

In the discussion Mr. Smith gave special emphasis to means which may be employed in reducing the cost of equipment for manual-training work.

The discussion was opened by Miss Flora Wilbur, principal of the Teachers' Training School of Moline, who evidently spoke from a rich experience in elementary school work, and with full appreciation of the pedagogical problems involved in such work. A brief general discussion followed. Much interest was manifested in two exhibits brought to illustrate the first paper. One showed the course in constructive work taught in the Ethical Culture Schools of New York City, the other was a small exhibit of bent iron work from Bradley Polytechnic Institute.

Among the speakers in the section meetings of Friday afternoon were Mr. Louis R. Abbott, Director of Manual Training at Moline, and Supervisor Robert M. Smith, of Chicago. The Friday evening session was devoted to an illustrated lecture by Mr.

J. Liberty Tadd, Director of the Public Industrial Art School, Philadelphia. His subject was "Art and Manual Training."

If the Friday morning session, already referred to, was devoted to a discussion of the specific and practical, the Saturday morning session was as truly devoted to the general and philosophical. Mr. F. A. Manny, of the State Normal School at Oshkosh, Wis., recently elected principal of Workingman's School, New York City, read a strong paper on "Industrial Training as a Social Factor." "The Pedagogical Basis for Industrial Training" was ably discussed by Professor A. W. Moore, of the University of Chicago; while the sociological bearing of educational handwork was set forth in a most pleasing address by Professor George E. Vincent, also of the University of Chicago. The discussion was led by Miss Cora M. Hamilton, Supervisor of the Teachers' Training Department of the Pontiac High School. She was followed by President John W. Cook, of the De Kalb Normal School, Professor Wilbur S. Jackman, of Chicago Institute, and Professor Charles McMurry.

At a business meeting before adjournment a committee was appointed to prepare a bibliography of manual training, to be ready for publication at the time of the next autumn meeting. This bibliography is to be compiled with special reference to the needs of the regular teachers in the public schools.—EDITOR.

QUERIES.

1. WHICH is the best way to treat blue prints to be used by the boys? "I have tried mounting on cardboard, but perhaps somebody has hit upon a better plan."

2. How much latitude in the choice of models should be left to the teacher? and how much can be safely entrusted to the pupil's own initiative?

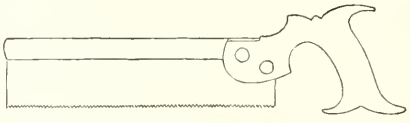
3. Is there any better method for fixing responsibility for tools for general use than the "check system" so often used in manufacturing establishments?

4. What has been done by teachers of manual training to change the size or form of tools so as to better adapt them to the needs of children in the lower grades of the grammar schools?

REPLIES.

1. In regard to treating the prints for the use of the boys, a most excellent way is to mount them on sheet tin or iron, and shellac them. They will then withstand hard usage and remain in good condition.—LYLE BROWER, Rockford, Ill.

4. I have been asked by the editor to tell about two special tools that have been successfully used by children for over a year. When the school year began in October 1898, at the University Elementary School, there were a number of little ones physically unable to use the ordinary-sized back saw or chisel. Therefore it became necessary to have something special for them. The result was the two tools shown here. They have proved so successful that a number of schools have adopted them.



The saw is made of the best of steel and weighs 6½ oz. The blade is 8 inches long and 1¾ inches wide. The handle is hung low so the child may apply the power with the least exertion. It has been found that a shorter bench hook — one not over

8 inches long—works better with the children than does a longer one. Another simple device that helps the child to hold the work is an eccentric put on the bench hook. The eccentric is simply a 2 or 3-inch circular piece of half inch board with a half inch hole bored half way between center and circumference, into which is glued a piece of half inch dowel, $1\frac{1}{4}$ inches long. Through the center of the bench hook are bored half inch holes, $1\frac{1}{4}$ inches apart for the eccentric. This is a wonderful help to the younger children, and often to some of the older ones.

The chisel is $6\frac{1}{4}$ inches long with a blade $1\frac{5}{8}$ inches long and $\frac{5}{8}$ of an inch wide, with a $\frac{3}{16}$ inch bevel. It is made by a regular manufacturer of fine chisels, and is of as good steel as the best of tools. The handle has a shoulder or guard that keeps the hand from slipping. The children use it in the same manner as a high-school student would use a regular-sized tool. Both of these tools have received as hard usage as any tool could, and have proven that they are not toys.—FRANK H. BALL, Chicago.

BREVITIES.

SUMMER Schools offering courses in manual training: Columbia University, New York City, July 2–August 10; manual training for elementary schools: two courses. Mechanics Institute, Rochester, N. Y., July 9–August 4; woodworking and drawing. American School of Sloyd, Cottage City, Mass. Chicago Institute, July 2–August 10; Constructive work for lower grades and a course in shopwork. Chicago Normal School, July 2–20: Constructive work for lower grades. Teachers Training College of the German Association for Manual Instruction, Leipzig; information can be obtained from F. R. Inman, 170 Medway st., Providence, R. I.

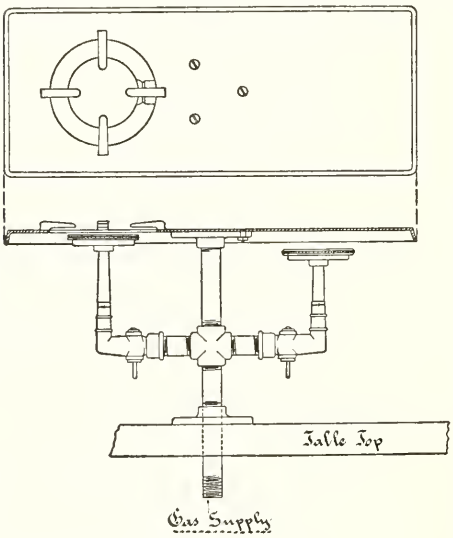
OFFICIAL BULLETIN No. 3 of the National Educational Association announces a strong program for the department of manual training. The first session, July 11, will open with an address by the president of the department, Charles H. Keyes, supervisor of schools, South District, Hartford, Conn. His subject is "The Relation of Manual Training to Trade Education." This will be followed by a discussion of the "Character, Content, and Purpose of the Course in Manual Training for Elementary Schools," led by Col. Francis W. Parker, president of the Chicago Institute; Professor Charles R. Richards of Teachers College, New York City; and Mr. Gustav Larsson, principal of Sloyd Training School, Boston. The second session, July 12, will be devoted to "High School Courses in Manual Training." The discussion of this topic will be led by Supt. J. H. Van Sickle, of Baltimore, Md., recently of Denver; Mr. Charles B. Howe, principal of Manual Training Department of Hartford High School; and Mr. B. A. Lenfest, principal of Manual Training High School, Waltham, Mass. On July 13, Dr. C. M. Woodward, president of the Board of Education, St. Louis, Mo., will speak on manual training before the department of School Administration.

THE fourth semi-annual meeting of the New England Association of Teachers of Metal Work was held in Worcester, Mass., Friday and Saturday, March 30 and 31. The first day was spent in visiting the factories of the Norton Emery Wheel Co., F. E. Reed Co., and the Woodward & Powell Planer Co. In the evening an informal

social was held at the Bay State House. On Saturday morning, after inspecting the shops of the Worcester Polytechnic Institute, the association met in the engineering laboratory lecture room and gave attention to an address by President Mendenhall of the Institute on "The Working Relation of the Technical School and the Manual Training School." This was followed by a paper by Principal B. A. Lenfest of the Waltham Manual Training High School on "The Function and Scope of Metal Work in Manual Training Schools," and by a general discussion. At the afternoon session Mr. Walter M. Smith of the Ringe School, Cambridge, read a paper on "Clipping and Filing." The correspondence committee then made its report, this being the results of a study of courses in clipping and filing as practiced by members of the association.

MR. EDWIN W. FOSTER, who contributes the article on "Leaf Forms of Our Common Broad-Leaved Trees," has written a series of eight articles on the same general subject which will appear with numerous illustrations in the *St. Nicholas Magazine*.

A GAS STOVE.—The accompanying cut represents an individual gas-cooking stove for the use of schools. The top is of cast iron fifteen inches long and six inches wide. One side is open for rapid heating and the other serves as a warming plate. The frame is made of gas pipe and fittings, and is nickel plated. The burners are of the Bunsen type and with the cocks, pipe, and fittings, may be purchased from any first-class dealer in gas fixtures and supplies. The base of the stove is screwed to the top of the table and the supply of gas enters through the bottom. The complete stove stands seven inches high.



The chief merits of this stove are its simplicity, cleanliness, utility, and neatness of appearance. It is very rigid and the open space underneath makes it easy to keep the table top clean.—C. B. HOWE.

THE board of education of West Superior, Wis., has just adopted plans for a new high-school annex to cost $30,000 and to be ready for use by September 1. It will make adequate provision for manual training, thereby giving great satisfaction to Supt. W. H. Elson, who in season and out has been advocating a manual-training high school.—*School Journal.*

THE new auditorium of the Denver Manual Training High School was dedicated May 1. On the following day the *Daily News*, commenting editorially said of the

school: "The growing popularity of the school, and the excellent work it is doing have already vindicated the wisdom of those who were most active in its creation. When started it was somewhat in the nature of an experiment, but it long since passed that stage, and is recognized with special favor by the public. In this age of active industry, it has become necessary to train the hands as well as the brain, to learn to do as well as to think, and to accomplish this was the purpose that led to the establishment of this school. Its success has been phenomenal. Its practical courses for girls and boys already have exercised a healthful influence on the youth of the city, and will continue so to do for years to come."

BOSTON.

In lecturing to the Twentieth Century Club, upon "Secondary Education and its Development," Paul H. Hanus, professor of pedagogy at Harvard University, discussed the great importance now attached to the function of the high school as a preparation for life, as compared with its office as a preparation for college. He justified the introduction, under certain limitations of the elective system, and endorsed the value of manual training in secondary schools for purely educational purposes. He further believed that such institutions, as Drexel of Philadephia, Pratt of Brooklyn, Lewis of Chicago, and Bradley of Peoria, have shown the general need also for technical training in secondary schools. He deplored the tendency to establish separate independent kinds of high schools — as English, Classical, Manual Training and Commercial — and strongly urged the adoption of "a comprehensive system of secondary education, in which these schools are closely related as inter-dependent departments, permitting a constant exchange and interchange of pupils."

At the club rooms, before the members of the educational department and invited guests, John M. Tyler, professor of biology at Amherst College, spoke upon "The Fundamental and the Accessory in Education." This age, he said, needs strength. We have agile and liberal minds and those which if need be, can harmonize three contradictions; but too few minds capable of powerful, long-sustained activity. We get debauched by logic. The mind should not be a sponge — but a switch-board. The incoming sensory nerve currents should be converted into outgoing motor currents. Exercises which bring strength and toughness to the muscles of the shoulder, trunk, and thigh develop certain brain tracts, which give staying power to the nervous system and prove a safeguard against nervous prostration. He briefly traced through the lower forms of animal life the evolution of mental power and showed that feeling is more primitive than thought; that feeling is common to the race and is hereditary, while thought varies with each individual and is not inherited. For example: no one inherits a knowledge of the multiplication table. He claimed that feelings center around convictions which have been inherited and that a love of truth, of duty, and of honesty is transmissible from parents to offspring. Women feel more than men and are consequently better adapted for teaching in schools of the lower grades; because greater stress should be put upon activity of the emotional nature, as well as upon activity of the sets of larger muscles, at the proper formative period, if the foundations are to be laid for a race of greater mental strength.

An exhibition of the work of the graduating class of the Sloyd Training School was held at the school building 39 N. Bennet st., May 25 and 26. Several hundred invitations were issued and many prominent educators were among the visitors. The working drawings, and a portion of the models made during the year b each member

of the class graduating from the grammar-school department were shown. A special feature of the exhibit was a group of original models designed by the class. The carving, turning, and advanced bench work of the students from the high school department elicited much favorable comment.

The visitors were able during certain hours, to see the normal class at work, and also a class of grammar-school boys under the instruction of a normal student.

On one of the days Tommy Stringer — the deaf, dumb, and blind boy whose education has awakened so much public interest — was present for his regular lesson. Groups of observers almost constantly surrounded his bench, wondering at his skill and joy in tool work.

At the graduating exercises, on June 2, Rev. Chas. G. Ames, D.D., addressed the class. He emphasized the value of self-possession, self-direction, and a wise choice of ends; showing that happiness lies in the enjoyment of processes, rather than in the attainment of ends; quoting George Eliot:

"Who draws a line and satisfies his soul,
Making it crooked where it should be straight?"

Mrs. Quincy A. Shaw, through whose munificence the school was founded, and is maintained, awarded the diplomas, assisted by the principal of the school, Mr. Gustaf Larsson. In addition to the diploma each of the twenty-one graduates received a badge, and a bouquet of flowers. The badge is a small gold try-square, upon which S. T. S. in Runic characters is enameled.—CHARLES W. PAUL.

CALIFORNIA.

WALTER J. KENYON, formerly supervisor of manual training and drawing at Stockton, and who has for the past two years been connected with the Lowell, Mass., State Normal School, will again return to the Pacific coast. He will be instructor in manual training in the San Francisco State Normal School, of which institution Professor Frederic Burk is president. California is fortunate in again being able to welcome Mr. Kenyon into its educational life.

THE county of Los Angeles, through its board of education, contemplates a great movement, and one that will put it in the very fore front in the educational world. It is proposed to introduce manual training into the first four grades of school throughout the county. This will necessitate preparation on the part of all teachers, and efficient supervisors will be engaged to carry on the work. Should the movement succeed, Professor Arthur H. Chamberlain, of Throop Polytechnic Institute, will be requested to organize work in the summer session along manual lines.

THE city of San Francisco is to have manual training introduced into its school curriculum. Mr. C. T. Work, of the Colorado State Normal School, has been called to the position of supervisor.

THROOP POLYTECHNIC INSTITUTE is enlarging its sphere of usefulness. To the normal school department, now comprising courses in sloyd and the domestic sciences, will next year be added a normal course in art.

MISS F. F. STERRETT, who is to have charge of the art work, will spend the summer and early fall in Europe, studying in Paris. She will carry with her a commission to purchase certain art materials for the institute.

IT IS intimated that in the schools of Los Angeles, the manual-training courses will be made more comprehensive; cardboard construction may be introduced into the lower grades.

THE State Normal School at Los Angeles will introduce cooking next year.—ARTHUR H. CHAMBERLAIN.

THE principal of the Cogswell Polytechnic College, Mr. J. L. Culver, died a few months ago. His successor is Mr. Oscar Lewis, formerly a member of the board of directors. Mr. Lewis has resided in this city many years, and was formerly proprietor of a large machine shop and foundry. He informs me that they will make some radical changes of curriculum, beginning next fall. They feel that the Lick School has been highly successful and will follow its plan, except that they will give a one year preliminary course, instead of the two that is being required at the Lick. In other words they will become distinctly a trades school.

THE city of Alameda has a proposition on foot to establish a manual-training school, and it seems now a certainty. The city of Oakland, also, is planning to enlarge the Central Manual Training School, which heretofore has had only a course of woodwork. The city of Modesto has voted a new high-school building, which will be erected with provision for manual training in the near future.—GEORGE A. MERRILL.

MINNEAPOLIS.

THE trustees of the Washburn Memorial Orphan Asylum have just completed arrangements whereby the boys of that institution will, hereafter, receive regular instruction in sloyd. A shop has been neatly equipped with fifteen single benches and as many sets of tools for the older boys, and the younger ones are provided with desk trays containing tools for drawing and knife work.

Steps have been taken by the Board of Education looking toward the reëstablishment of manual training in the grade schools. It will be remembered by those who are acquainted with us that, for financial reasons, this phase of our work was suspended two years ago.—J. E. PAINTER.

NEW YORK.

MANUAL training has taken a step forward in Binghamton, N. Y.; it has been made compulsory for both boys and girls in the ninth grade. This, in addition to what is being done for high-school students at the Barlow School of Industrial Art, enables nearly four hundred pupils in the city to get the benefit of courses in manual training.

MR. GEORGE EASTMAN, of kodak fame, has given $200,000 to the Rochester Athenaeum and Mechanics Institute of Rochester, N. Y. His gift was announced March 23. He has purchased a large block of land adjoining the present site of the Institute and will soon erect thereon a building which will be of sufficient size to enable the school to greatly enlarge its sphere of usefulness. Mr. Eastman's gift is all the more welcome because, instead of establishing a new institution bearing his name, he has made a gift to a school already established and doing a noble work. It is indeed a fitting recognition of the efficiency of the work which was begun in a drawing class fifteen years ago by Mr. E. C. Colby, and has been steadily growing, under his direction, ever since until now nearly 1000 pupils are receiving instruction in classes in drawing, painting, designing, modeling, English, mathematics, science, manual training, and the domestic arts.

THE second annual Lake Placid Conference on Home Economics is announced for July 3 to 7 at Morningside, N. Y. As stated in the announcement, "this conference is devoted to the scientific and sociologic study of the home, the aim being to

concentrate the best thought of leading workers along special lines in order that the discussions of each year may count as distinct progress in some limited part of the field. On the program for this year are found the names of a large number of the leading teachers of domestic science, among whom are the following: Mrs. Ellen H. Richards, of the Massachusetts Institute of Technology; Miss Helen Kinne, of Teachers College, New York; Miss Abbie Marlatt, Providence Manual Training High School; Miss Emma S. Jacobs, director of cooking, Washington, D. C.; Miss Louisa A. Nicholass, State Normal School, Framingham, Mass.; Miss Annabel G. E. Hope, Normal School of Domestic Science, Hamilton, Ontario; Mrs. Alice P. Norton, of Brookline, Mass., recently elected to take charge of the department of domestic science at Chicago Institute; Mrs. Virginia C. Meredith, Minnesota School of Agriculture; Miss Isabel Bevier, Lake Erie College, Painesville, Ohio; Miss Anna Barrows, of the *American Kitchen Magazine;* Miss Martha Van Rensselear, Cornell University; Mrs. Mary Hinman Abel, Baltimore, Md.; Mrs. Frances C. Caldwell, Rochester Athenaeum and Mechanics Institute; Miss Annie E. Allen, Cambridge, Mass.; Mrs. W. E. Woodford, New York State Household Economic Association; Miss Caroline L. Hunt, Lewis Institute, Chicago; Mrs. Mary Roberts Smith, Stanford University, California; Miss Marion Talbot, University of Chicago; Miss Henrietta I. Goodrich, School of Housekeeping, Boston; and Miss Parloa, of Boston. The chairman of the conference is Mrs. Richards.

NEW YORK CITY.

INDUSTRIAL training was one of the subjects discussed at the recent Ecumenical Conference on Foreign Missions in this city. It first appeared on the program of a meeting held at the Central Presbyterian Church, April 25, where a paper was read by Principal Myron T. Scudder, of the Normal School of New Paltz, who advocated manual training as an essential part of the school curriculum. In the discussion which followed several speakers, among whom were missionaries from Egypt, India, and Chile, added their testimony to the value of industrial training in missionary work.

At a meeting held April 26 at the Union Methodist Church the Rev. James Smith, a missionary from India, spoke on "Industrial Education in India." Mr. Smith made a plea for an education which would develop latent powers and prepare boys and girls for useful and honorable lives. "Nature's so-called misfits are really good material spoiled by raw apprentices in the molding." Traditional methods of education and the deep-seated prejudice against manual labor of any kind which existed in India rendered progress extremely difficult. Mr. Smith advocated manual training for all. The Rev. D. S. Spencer, of Japan, dwelt upon the necessity of educating converts to help themselves in satisfying the new needs and aspirations which necessarily arise as they become civilized and Christianized. Several other speakers followed, all substantially agreeing as to the importance of industrial education as a factor in the uplifting of heathen people.

At a regular meeting of the Manual Training Teachers' Association of the city of New York, held April 4 at P. S. No. 30, the adoption of a constitution and by-laws formed the chief topic of debate. The constitution, as finally adopted, restricts active membership to persons "engaged in teaching manual training in the New York Public-School System of the Boroughs of Manhattan and the Bronx." Provision is made however for the admission of associate members who are entitled to all privileges of the association except the right to vote and to hold office. After business matters

had been disposed of Mr. T. Harry Knox read a paper on "General, not Special Efficiency the Function of Manual Training in Elementary Schools" which was listened to with much interest by all present, and called forth a lively discussion.

An adjourned meeting was held on the 18th when Mr. W. F. Vroom gave a stereopticon lecture on "Timber — Its Characteristics and Properties."

An elaborate collection of photographs illustrating various phases of the work carried on in the public schools of this city has been sent to the Paris Exposition. All grades are represented, including kindergarten, primary, grammar and high schools, and college. Specimens of pupils' work are shown in paper cutting and folding, clay modeling, sewing, free-hand and mechanical drawing, and woodworking; also courses of work in sequential arrangement, including the new shop-work course.

A number of pictures of classes at work forms an interesting feature of the collection. These embrace scenes in all branches of manual training in its broadest sense, besides kindergarten plays, singing, chemistry, physics, electricity, calisthenics, gymnastics, and other lines of activity characteristic of the modern curriculum.

The work of the vacation schools which proved so successful last summer has received due attention, the photographs showing samples of boys' and girls' work in each of the twenty different branches taught.

The whole exhibit, while its general arrangement is well calculated to give an intelligent idea of our educational methods, is clear and accurate in detail, and artistic withal.

A PERPLEXING feature of the charitable work of industrial classes in the crowded districts of this city, is the difficulty of keeping children interested in their work and regular in attendance. With a view to rendering the work more attractive, and thereby reducing this difficulty, an interesting experiment has been undertaken by Mr. Henry Wheeler, of the Hebrew Technical Institute, who is in charge of an evening class at Grace Chapel Industrial School. The course of work adopted consists of simple pieces of electrical apparatus, mainly of wood, such as a pith-ball stand, a single-cell battery, a three-cell battery, an electric push-button, etc. The work is carried on in a room provided with woodworking benches and tools with accommodations for a class of fifteen. Though the new course has been in operation but a short time, better results have been obtained than from the old course of simple woodwork. In the same school a class in electricity for older boys, under the instruction of Mr. W. W. Ker, has just completed its first year. This class meets one evening each week, the exercises being arranged with a view to making the most practical use of the limited time, exciting the interest of the pupils and creating a desire for further knowledge. The experiments pursued are as follows: making a magnetic field; tests with ampere-meter and volt-meter; tests with large pair of electro-magnets, using electric light current which is distributed from a switch-board in the room tests on ordinary arc lamps, incandescent lamps, dynamos, and motors. Lectures are given frequently which are well illustrated by stereopticon views of the apparatus used in the experiments and in practical work.

AN unusually large and attractive exhibit of pupils' work was opened to the public at Teachers College, June 1, embracing the work of the Horace Mann School in all grades from the kindergarten to the senior class in the high school. Though the excellence of the work throughout is worthy of notice and fully upholds the

reputation of the school the limits of space forbid special reference to more than a few points of interest.

Marks of progress in the development of a comprehensive scheme of manual training are to be observed chiefly in the lower grades, which have received much thought and attention during the past from Professor Richards, head of the Manual Training Department. Much emphasis has been laid on self-expression. Besides the more ordinary lines of work, such as paper cutting and folding, clay modeling and basket weaving, the children are taught to express their own ideas in concrete form through the medium of various materials, the things made being suggested usually by their reading. Thus in the second grade a miniature Hiawatha village has been made; in the third a Viking ship and a reproduction of Robinson Crusoe's dwelling in the fourth a log hut, etc. Self-expression is further encouraged by allowing the child to select his own model for imitation, or to modify according to his own taste a design which is presented to the class. In the second and third grades the children weave blankets (about four inches by six inches) on looms made by themselves of cardboard boxes. They are led to suggest the construction of the loom and to originate the designs for the blankets, which are woven in colors. In the more advanced grades the principle of self-expression is brought out more especially in the decoration of class models by means of carving, inlaying, etc.

For the first six grades the class room is furnished with a work bench with a few simple tools, where some of the children are allowed to work while the others are working at the desks. This bench with its equipment is used for nearly all the work in wood done below the fifth grade. Work in thin wood, mechanically laid out, is begun in the fifth grade, the only cutting tool used being the knife. In the sixth grade knife work is continued, but thicker wood is used. Bench work begins in the seventh grade.

A noteworthy departure from the traditional line of machine-shop models is to be seen in the work of the fourth-year high-school class, under Mr. C. P. Benns. The articles exhibited include a spanner wrench, a gyroscope, a level, a brass paper-weight, a mercury plumb-bob and a bicycle pump. Whatever may be said of the advantages of the class "project," it is certain that this course, besides giving the pupils thorough training in machine-shop practice, has appealed forcibly to their interest.

W. F. VROOM.

MISS LUCY H. WEISER, teacher of manual training in the elementary public schools of East Orange, N. J., will teach one of the summer courses in manual training at Columbia University this year. Next year, under Professor Richards, she will be in charge of the manual training work of the lower six grades of the Horace Mann School, the School of Observation of Teachers College, Columbia University. Miss Weiser is a graduate of Teachers College.

A WRITTEN examination for licenses as teachers of shopwork in the boroughs of Manhattan and the Bronx will be conducted by the board of examiners on September 10, 1900, at the Hall of Education, 59th street and Park avenue. A recent examination for such licenses was governed by the following regulations:

(*a*) Each applicant must be at least eighteen years of age.

(*b*) Each applicant must be a graduate of a high school or an institution of equal or higher rank, or have a general education that is practically equivalent.

(*c*) Each applicant must be a graduate from a course of professional training of at least one year in shopwork.

(*d*) Each applicant must pass a written and an oral examination.

The written examination will be upon plane geometry, mechanical and freehand drawing, principles and practice of shopwork, methods of instruction, and class management. The oral examination will include tests of technical skill and knowledge.

In the written and oral answers to examination questions, the applicant must show ability to use the English language correctly.

A supplementary academic examination will be required of all candidates, whatever their academic history, who in the judgment of the Board of Examiners, should undergo such a test. Applicants who are not graduates of high schools or other institutions of equal or higher rank may be required to prove their academic qualifications by passing such an examination.

All documents submitted as evidence of scholarship or experience must be originals and must be accompanied by duplicate copies. These should be submitted on the first day of the examination.

Each applicant who passes the examination will be required to report for physical examination by one of the physicians authorized by the Board of Education. No person will be licensed who has not been vaccinated within eight years.

The licenses issued under these regulations hold for the period of one year, and may be renewed without examination in case the work of the holder is satisfactory to the Borough Superintendent for two successive years. At the close of the third year of continuous successful service, the City Superintendent may make the license permanent.

THE Brooklyn (N. Y.) Manual Training School is suffering from "nervous prosperity." At the opening of the new term, February 1, 250 new students were admitted, The old building, long since inadequate and in a chronic state of congestion, is now full and running over. The spectacle of an instructor trying to teach sixty-five students at one time in shop-work, is as much a fact as an indication that a new building should be delayed but a very short while.— EDWIN W. FOSTER.

ILLINOIS.

ROCKFORD now offers manual training courses to boys in the seventh and eighth grades of the grammar schools and the first and second years of the high school.

WATSEKA is to have a summer school of manual training, thanks to an enterprising Woman's Club. Mr. Fred. D. Crawshaw, of Bradley Polytechnic Institute, Peoria, has been engaged as teacher. A room in a public school building will be equipped with tools and temporary benches for woodworking.

AT a recent meeting of the Board of Trustees of the University of Illinois, appointments were made in the new department of household science which is to be established at the opening of the next University year. The professor in charge of the department will be Miss Isabel Bevier, now professor of chemistry and household sciences at Lake Erie College, Painesville, Ohio. Miss Bevier is a graduate of Wooster University, and has done considerable postgraduate work at the Massachusetts Institute of Technology, at Harvard, and also with Professor Atwater, at the Wesleyan University, Middletown, Connecticut. She has several times been appointed by the Department of Agriculture at Washington to make special investigations in economic

questions relating to the household, spending one summer at Hampton, Virginia, investigating the life of the negroes. She will be assisted in her work by Miss Elizabeth C. Sprague, who was appointed instructor in the department. Miss Sprague is a graduate of the Cincinnati High School, and of the Massachusetts Normal School of Household Arts. Provision is being made for the new department in the group of agricultural buildings.

CHICAGO.

THE question of what should constitute an outfit sufficient to give a class in manual training all the tools really needed in their bench practice, is considerable of a bugbear to those thinking of introducing industrial work into a system of schools. Persons with little or no idea of what should constitute an outfit have presented extravagant estimates that in very many cases have prevented the introduction of such work into the schools of communities sadly needing education of this kind.

One of the most vital questions dealt with during the present school year by Mr. Smith, the Supervisor of Manual Training, has been this one of outfit. When the stone wall of shortage of money to purchase more tools for new centres and for the payment of additional teachers confronted him, he turned his attention to the existing centres and found that they were more generously supplied with tools than necessary. After consulting with the teachers he prepared the list given below and had the surplus tools in each centre sent to the supply house and distributed to *sixteen* new centres.

These sixteen centres have been supplied without any expense to the Board of Education, the benches in each case being furnished by private subscription by principals, teachers, and patrons of the school. No new teachers were employed, but the time of those already teaching was rearranged so that all the schools were taken care of without additional expense. In several cases the work of the teacher is at two schools, which is obviously better than having pupils travel long distances to receive their manual-training instruction.

Revised equipment for manual-training centres:

6 benches for four pupils	$18.00	24 1-inch chisels	$13.30
1 grindstone	20.00	8 ⅞-gouges (regular)	3.20
8 jack planes, No. 5	12.25	6 common spokeshaves	1.50
24 smooth planes, No. 2	29.28	2 gooseneck scrapers	0.40
10 blades for No. 5 plane	2.00	2 straight cabinet scrapers	0.40
20 blades for No. 2 plane	4.00	24 ebony lined "T" squares	6.00
12 back saws	10.32	24 ebony 45 triangles	3.84
6 panel saws	8.16	24 ebony 30° triangles	3.84
6 rip saws	9.00	24 drawing boards	18.00
1 turning saw, 14-inch	0.90	24 compasses	9.60
2 turning saws, 12-inch	1.80	12 rubber erasers	0.96
6 turning saw blades, 14-inch	0.84	1 blackboard compass	1.25
6 turning saw blades, 12-inch	0.84	2 gross thumb tacks	0.30
6 hammers	2.10	24 12-inch drawing rules	1.20
2 rubber mallets	1.50	3 1-inch varnish brushes	0.63
3 common bit braces	2.25	3 1½-inch varnish brushes	0.93
1 set Jennings auger bits	4.00	3 varnish cups	0.90
6 dowel bits, 3¼-inch and 3½-inch	1.20	1 slip stone	0.10
2 countersinks	0.40	6 Washita oil stones	3.00
2 screw-driver bits	0.20	24 try squares	6.00
2 oilers	0.20	1 "T" bevel	0.30
2 ¼-inch chisels	0.80	24 rules, 2 ft; four fold	2.40
2 ½-inch chisels	0.60	24 marking gauges	6.00

6 dividers	$1.92
4 screw drivers, 7-inch	1.00
6 nail sets, various sizes	0.60
12 chip carving knives	2.40
25 whittling knives	2.40
4 flat files, 8-inch	0.80
6 half round files, 8-inch	1.20
1 saw file	0.10
1 bit file	0.15
1 file card and brush	1.25
6 coping saw frames	$1.20
3 doz. coping saw blades	0.36
12 carving punches (6 square and 6 half sq.)	1.80
6 wood hand screws, No. 6	3.00
6 wood hand screws, No. 10	3.00
24 bench hooks	6.00
1 locker case	30.00
6 counter brushes	3.00
6 whisk brooms	0.90

It can be seen from the above list that an outfit can be purchased for less than $280, sufficient to give twenty-four boys at a time the work in elementary manual training. This shows that there is no community in which work of this kind cannot be started. If public funds cannot be appropriated to initiate it, some one can be found to give the amount required that the demonstration of the value of manual training can be made.

Mr. Oscar McMurray, teacher of manual training in the McCosh School, has been awarded a scholarship of $650 in Columbia University and will spend the next year in study in that institution.

Mr. Riddell, of the Louis Nettlehorst School, will resign at the end of the term and spend the next two years in Paris in the study of art.

These two cases are illustrations of the fact that manual training does not unfit a man for other work.—ALBERT R. ROBINSON.

THE Chicago Sloyd School for Training Teachers was opened several months ago under the direction of Miss Anna Murray. It is located in the Athenaeum Building on Van Buren street. The special aim of this school is to prepare teachers of manual training for primary and grammar schools. The course includes instruction in pedagogy, woodworking — including carving and fire-etching, mechanical drawing, Indian basket weaving, macrame, bent iron work, leather embossing, sewing, and embroidery. Opportunity is also given for practice teaching. Since the death of Miss Toppelius, Miss Murray has been the leading American representative of that particular shade of manual-training work which had its origin in the sloyd of Finland. During the last few years Miss Murray has been a teacher of manual training in one of the public schools of Chicago, at the same time conducting classes in normal work.

MR. EDWARD F. WORST, who is to give the course in constructive work at the Chicago Normal Summer School this year, is the author of a book entitled *Constructive Work, its Relation to Number, Literature, History, and Nature Work.* Parts of this work have appeared in the *School Weekly* since last October. The book is published by Frederick A. Watt, 40 East Randolph street, Chicago.

EDITORIAL.

Dr. Thomas C. Mendenhall, the writer of our leading article in this number, speaks from a long and rich experience as an educator and scientist. Born in 1841, near Hanoverton, Ohio, which afforded few opportunities for scholastic training, he was obliged to depend largely upon his own efforts in getting an education. These he put forth eagerly and to such a purpose that at an early age he became a teacher. He developed such a fondness for study and reached such proficiency in mathematics and physical science that on the opening of the Ohio State University in 1873, he was elected to the chair of physics and mechanics. One of the first working laboratories for students in the United States was organized by him at this time. In 1878 he went to Japan to become professor of physics in the Imperial University, but returned in 1881 to resume his work at the Ohio State University. In 1884 he went into government service at Washington as professor of electricity in the United States Signal Service. In 1886 he resigned to accept the presidency of the Rose Polytechnic Institute, at Terre Haute, Indiana. After serving in this capacity for three years he was appointed, in the summer of 1889, as superintendent of the United States Coast and Geodetic Survey, with headquarters at Washington. Late in 1894 he left the service of the government to assume the duties of president of the Worcester Polytechnic Institute, at Worcester, Mass. He has received the degree of Ph.D. from the Ohio State University, and that of LL.D. from the University of Michigan. He is a member of several scientific and engineering societies and was one time president of the American Association for the Advancement of Science. Dr. Mendenhall has been from time to time called upon to perform a number of important duties of a semi-diplomatic character, for which his training and experience had fitted him. Among these may be mentioned his service as one of the two United States Commissioners in the Bering Sea Investigation, also his appointment as commissioner on the part of the United States to mark the boundary line between Maine and New Brunswick and as commissioner to conduct the joint survey of the boundary line between Alaska and the British Possessions. He has published numerous contributions to science, in the *Transactions* of scientific

societies and in the leading scientific and educational journals. In 1886 he published a historical *résumé* in one volume, entitled "A Century of Electricity." He is actively interested in gravity research, having made determinations by the use of the pendulum in Japan and in Alaska and the Pribilof Islands, by improved methods and instruments, largely of his own design. As president of the Worcester Polytechnic Institute Dr. Mendenhall is now approaching the problems of higher education in the same spirit and with the same insight that has won for him such fame in scientific research.

Probably the most difficult thing the advocate of manual training has to do is to convince men of long experience in school work that the introduction of manual training need not crowd out of the school curriculum any of the several book subjects generally conceded to be indispensable. He can convince the merchant, the manufacturer, the doctor, and the minister, but the schoolmaster is jealous of any new subject that could by any possibility disturb his equanimity. Such conservatism is not surprising when we consider what a revolution has to be fought out in the mind of a schoolmaster of the older type before he can possibly square his experience with the claims of the advocate of manual training. He has seen the elementary school course enriched from the bare framework of the three R's until it now contains literature, history, civics, geography, physiology, and in some cases, one or two foreign languages. Perhaps some of these have come into the course against his better judgment, but they are there. What wonder that we hear him say "The curriculum is already overcrowded; it is useless to talk of adding another subject." From his point of view he is fully justified in this statement. You tell him that manual training properly introduced into the course need not diminish the amount of work done in the other studies, and he cannot understand you; he does not believe. He says, "But your manual-training work takes time, and our time is fully occupied. Two bodies cannot occupy the same space at the same time." He, of course, forgets that even in his crowded curriculum there are vacant spaces. If you fill a measure with apples — fill it full to running over, there will still be room for a goodly number of peas within the measure; even after it is filled with peas, there will be room for water. So with the course of study; it may be overcrowded with one kind of work and yet have large waste spaces in it that might well be filled with another kind. It is entirely within the limits of possibility

that this other kind might be an assistance to what is already there. There is no doubt that many courses of study are so crowded with work requiring mental activity of a certain sort that it would be worse than folly to add more of the same sort, but that proves nothing with reference to work of a different character. The fact is that an overcrowded curriculum of this particular kind is the one most in need of manual training. It is not that children shall have less mental training that manual training is advocated, but that they shall have more and better. Manual training gathers up the surplus activity — energy that usually goes to waste in the school, and applies it toward mental clarification and manual efficiency.

SUCH a testimony as is contained in the following clipping from the New Haven *Register* will do more to convince the skeptical schoolmaster of the practicability of manual training in the public schools than volumes of theory. We are glad to bring it to the attention of our readers.

Professor William G. Mixter, of the Sheffield Scientific School, has written the following letter, which tells its own tale, to Principal T. W. Mather, of the Boardman Manual Training High School, in reply to an inquiry received from the head of the Broadway Institution as to how the boys from his school were doing at Sheff:

Mr. T. W. Mather, Principal Boardman Training School, New Haven, Conn.:

My dear Sir: In answer to your letter of January 22, I will state that of the seven members of the freshman class who were prepared at the Boardman Manual Training School, six are now in the first division in scholarship. This is a very large percentage to attain a position in this honor division, and reflects great credit upon the preparatory school where they were fitted. It furnishes satisfactory proof that the instruction given in it will enable its graduates to maintain a high standard of scholarship in this department of the university.

Yours very truly,
WM. T. MIXTER,
For the committee.

No other school in the country makes as fine a showing. This notable success will be a surprise to many who have imagined that academic training at Boardman is less thorough than that given at high schools of the classical type, and is substantial attestation of Principal Mather's claim that time given to manual work and drawing does not interfere with book work, but rather helps to make it of higher grade.

OUR readers will be glad to notice that we have added an eight-page signature to this number. We expect to continue this enlarged size during the year 1900–1901. Subscribers will receive an index to Volume I with the October number.

REVIEWS.

Books.

Handbook of Domestic Science and Household Arts, Price $1.—A manual for teachers, for use in the elementary schools, just sent out by The Macmillan Company, comprising a series of sixteen chapters, written by eleven women, all of whom are practical, energetic teachers, and most of whom are teachers of domestic economy. The book contains a great amount of valuable material, and being written by so many different women has a value in the way of being suggestive which one writer could scarcely have given. "The House Beautiful" gives topics relating to the construction, ventilation, and furnishing of a house, as well as many hints for beautifying a home. Systematic care of a house is one strong point. The chapter of "The Kitchen" is especially strong, dealing with matters pertaining to the necessary cleaning with some directions as to the use of antiseptics, disinfectants, and deodorants. It also gives good lessons on fuels and care of the fire. "Foods" makes a long chapter on the organic and inorganic food materials. Some suggestions about food values and food economy are especially good. "The Principles of Cooking" gives many hints of the effect of heat applied in various ways to food materials. There is a chapter on "Starchy Foods and how to cook them;" one on "Proteids and how to cook them;" another on "Fish, Oysters, and Salads," and one on "Bread, Pastry, and Cake." These chapters all give directions for teaching the various subjects named, and also give typical foods under each head with recipes arranged for the use of the pupils. A chapter on the "Dining Room" and one on "The Bedroom" give hints on the furnishing and care of these rooms with directions as to how class work may be arranged to give pupils training in such work. The chapter on the dining room gives much that is of value on the serving of meals; while the one on the bedroom makes special mention of care of and food for invalids. "The Laundry" deals in the necessary knowledge for doing intelligent laundry work, and gives carefully the eight fundamental lessons which may be given in a school. The forty pages on "Household Pests" is suggestive for any teacher teaching any school, and will be helpful wherever children are studying, because of the interest always easily aroused in insect life. A short chapter on mending and sewing, and some very helpful suggestions about ways in which an ordinary schoolroom may be readily turned into a room suitable for teaching domestic economy, finish this interesting book.

All books on the subject of domestic economy are most welcome just now because of the very widespread and rapidly increasing interest in this line of work in the schools. This book has much excellent material and each chapter is strong in itself. It could scarcely be followed by teachers for their own use or for their classes, as the arrangement of the book is poor; for instance the chapter on "Starchy Foods and how to cook them" comes before the general chapter on "Foods" and also before the chapter on "Principles of Cooking." The chapter on the dining room comes between the one on "Fish" and the one on "Bread." There is an evident mingling of two purposes which detracts somewhat from the value of the book; a desire to give a manual for the teacher who has had no special training, and one which would also be of value to the well educated and trained teacher.

The book scarcely deals with the teaching needed by the average American pupil, when it gives as a "fact" the statement that "the usual and average American dinner consists of soup, celery, joint, potatoes, one other vegetable, salad, crackers, and cheese, dessert and coffee."

With the few faults we find very much of good, and every teacher of domestic economy will be glad to welcome this book as an expression of the work of many teachers.—NELLIE SAWYER KEDZIE.

A Practical Course in Mechanical Drawing.—By Fox and Thomas. D. Van Nostrand Co., New York, 1899; 5½ x 7 in., 98 pp. The title of this work might better have been, "A Practical Course in Machine Drawing," for it is a radical departure from books on mechanical drawing, so-called, as will be seen from the following contents: "Theory of Projection and Arrangement of Views;" "Use of Instruments;" "Dimension Lines;" "Drawing to Scale;" "Center Lines;" "Sections;" "Shading;" "Lettering;" "Screws;" "Gear Wheels;" "Reading of Drawings;" "Miscellaneous Directions." There are thirty-one progressive exercises each intended to illustrate a particular principle or method. The subject is supposed to be taught with the use of models which can be easily procured, and the course is claimed to be well adapted to high-school students and young mechanics. The aim of the work is to enable the student to make a working drawing of any actual piece of machinery; also to read an ordinary shop drawing. It is to be regretted that so few instructions are given as to the making of free-hand sketches from which ink drawings are made. In Fig. 18 a valuable opportunity was lost to show how the hexagon, the polygon most used by the machine draughtsman, can be easily and accurately constructed by the aid of the triangle. We do not know of any elementary work in which the subject of working drawings is so comprehensively, clearly and concisely treated as in this little book. The teacher who is not conversant with the best practice of the draughting room will find it especially helpful.—J. H. MASON.

The Use of the Slide Rule. By F. A. Halsey. D. Van Nostrand & Co. 3¾ x 6 in., pp. 84. Price, 50 cents. The book is a very comprehensive treatise on the use and misuse of the slide rule. In addition to many illustrative examples is given a number of full-sized cuts of different forms of slide rules which can easily be studied in connection with the examples given. The book certainly ought to be of great service to the student of engineering who uses one of these little "labor savers."—F. D. CRAWSHAW.

PAMPHLETS.

The Elementary School Record.—A Series of Nine Monographs, edited by Professor John Dewey and published at the University of Chicago Press. The first of the series is entitled "Art." It contains an article on "Principles of Education as Applied to "Art," by Miss Lillian S. Cushman, and detailed reports of the work in the several groups, or grades in the elementary school. These reports are made especially valuable by Dr. Dewey's discussions of general principles which govern the arrangement of the school work of each of these groups.

Manual Training in Wood. Outline of Course for Teachers by W. W. Murray Rochester Athenæum and Mechanics Institute, Rochester, N. Y. As its name indicates, this pamphlet tells what is required in the course leading to the manual-training teachers' diploma at the Mechanics Institute. It also contains notes on conventional lines and views employed in making working drawings.

Educational aspects of manual training. By Superintendent W. N. Hailman, of Dayton, Ohio. October number of the *Pedagogical Quarterly.* E. L. Kellogg & Co. Price 15 cents. In this address, which was given before the Present Day Club of Dayton, Dr. Hailman has put into interesting form some of the strongest arguments in favor of manual training as a factor in public education. We quote the following passage because we enjoyed reading it and because it is so suggestive.

"Who does not remember how much he is indebted for his mental development to the busy hands of childhood; what progress he made in hydraulics with the help of waterwheels he whittled from stray shingles and set to work in the brook; how he gathered ideas of the buoyancy of air and water from his boat and kite; what knowledge he acquired of the materials used, of forms and numbers involved; how successfully he studied geometry upon cookies, slices of apples, bits of clay or dough; or how, in idle moments, his mind, feeding upon the income of busy hours, practiced the art of pondering his acquirements in the imagination, the art of freeing them from the dross of materialness, of culling from his past achievements aspirations for higher ones, forming purpose, devising plans, inventing contrivances for their realization.

"It appears that the efforts of the mind to control and guide the hand in these matters are repaid an hundredfold, not only in clearer insight into all the details of form and composition, of properties and relationships of the materials used and of the objects turned out, but also in nobler aspirations, higher hopes, greater firmness of purpose, calmer self-reliance and a nearer approach to all-sided freedom. And it appears, too, that these things can come to man only through the activity of the hand in work and play."

The course in manual training in the public schools of Menomonie, Wis. This leaflet begins: "The course in manual training extends through fourteen years of the school life of the pupil. It begins with the occupation plays of the kindergarten, and ends with the machine shop practice of the last year of the high school. The boys and girls are trained in the same work until the fifth grade is reached. The girls continue the sewing, but the boys begin work upon thin slips of wood with the knife, rule, and square."

"Manual training is required in all the grades below the high school, and at least two years of manual training are required before graduation."

Then follows a compact and suggestive outline of the course of instruction arranged by years.

Course in Plumbing. Evening Trade School Department, Mechanic Art High School, Springfield, Mass. A leaflet giving an outline of a two years' course covering the theory of plumbing and the manual instruction which should accompany the theoretical work.

Aboriginal Chipped Stone Implements and *Polished Stone Articles Used by the New York Aborigines.* By William M. Beauchamp. Two Bulletins of the New York State Museum. Published by the University of the State of New York, Albany, N.Y. Price 25 cts. each.

Circulars of Information.

Marienfeld Summer Camp for Boys, Chesham, N. H. Conducted by Dr. C. Handford Henderson, Director of High School Department, Pratt Institute, Brooklyn. This little circular tells of a unique camp at the foot of Mt. Monadnock where a boy

may spend two months of his summer vacation out of doors "under conditions favorable to health, pleasure, and growth in character."

Public School Reports.

Newark, N. J. This contains a suggestive discussion of the value of manual training, by the superintendent of schools, and an excellent report by the supervisor of manual training. Newark spent $12,642 last year for manual training, $5000 of which is provided by the state. Instruction is given in grades above the fourth. The report contains an outline of the courses in manual training and sewing.

District of Columbia. In this report there are two paragraphs in particular which attracted our attention. Superintendent Powell says "the most important function of the school, after that of giving ethical training, is that of giving the child manual training (making him handy, accurate, and efficient) in the directed exercise of those activities by means of which he gets and uses knowledge." Mr. Chamberlain, director of manual training, in discussing the new manual-training high school soon to be opened in Washington, says: "Only as an independent institution does the manual-training school achieve its highest degree of success. Affiliation with a large, well-established school is theoretically alluring and has its advantages, but there are also too many disadvantages. The testimony on this point from men of experience is very strong. It is primarily a question of difficulty of organization; secondarily, one of that prejudice which is a natural outgrowth of training and not necessarily deserving of condemnation. There must be the utmost sympathy between the two classes of teachers, academic and manual."

The following have been received, some of which will be given more extended notice in the October number:

Cardboard Construction, by J. H. Tayborn. Rockwell & Churchill, Boston.

Constructive Work, by F. Robert Bartsch. Normal School Publishing House, Chicago.

Industrial Instruction, by Robert Seidel. D. C. Heath & Co., Boston.

Model Engines and Small Boats, by Nevil Monroe Hopkins. D. Van Nostrand Co.

Small Engines and Boilers, by E. P. Watson. D. Van Nostrand Co.

Massachusetts State Exhibition of Drawing in the Public Schools, by Henry T. Bailey. State Board of Education, Boston.

Proceedings of the Eastern Manual Training Association, 1899. Walter J. Kenyon, secretary, State Normal School, Lowell, Mass.

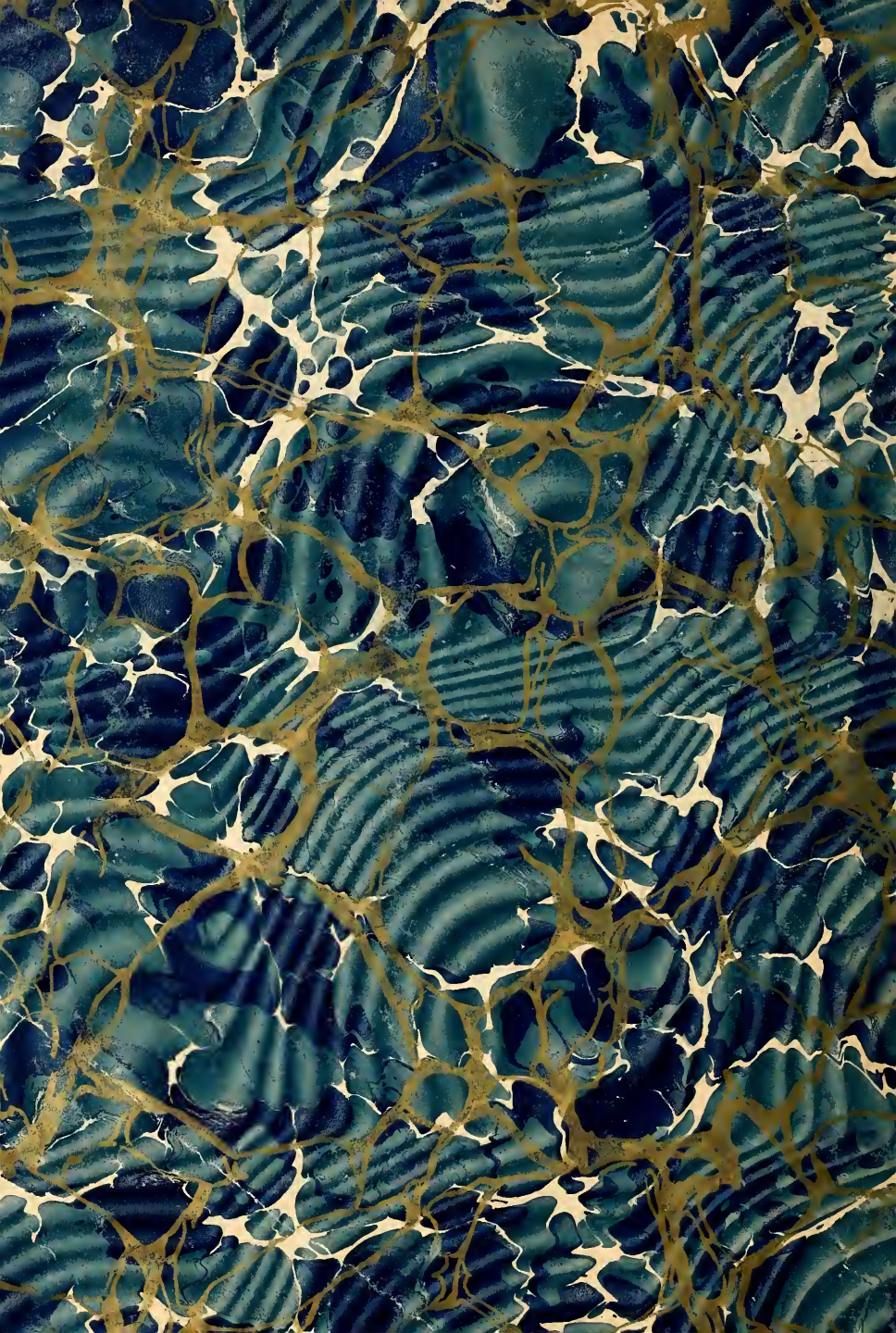
Industrial Education, the German Example, by J. C. Monaghan, Manufacturers' Club, Philadelphia.

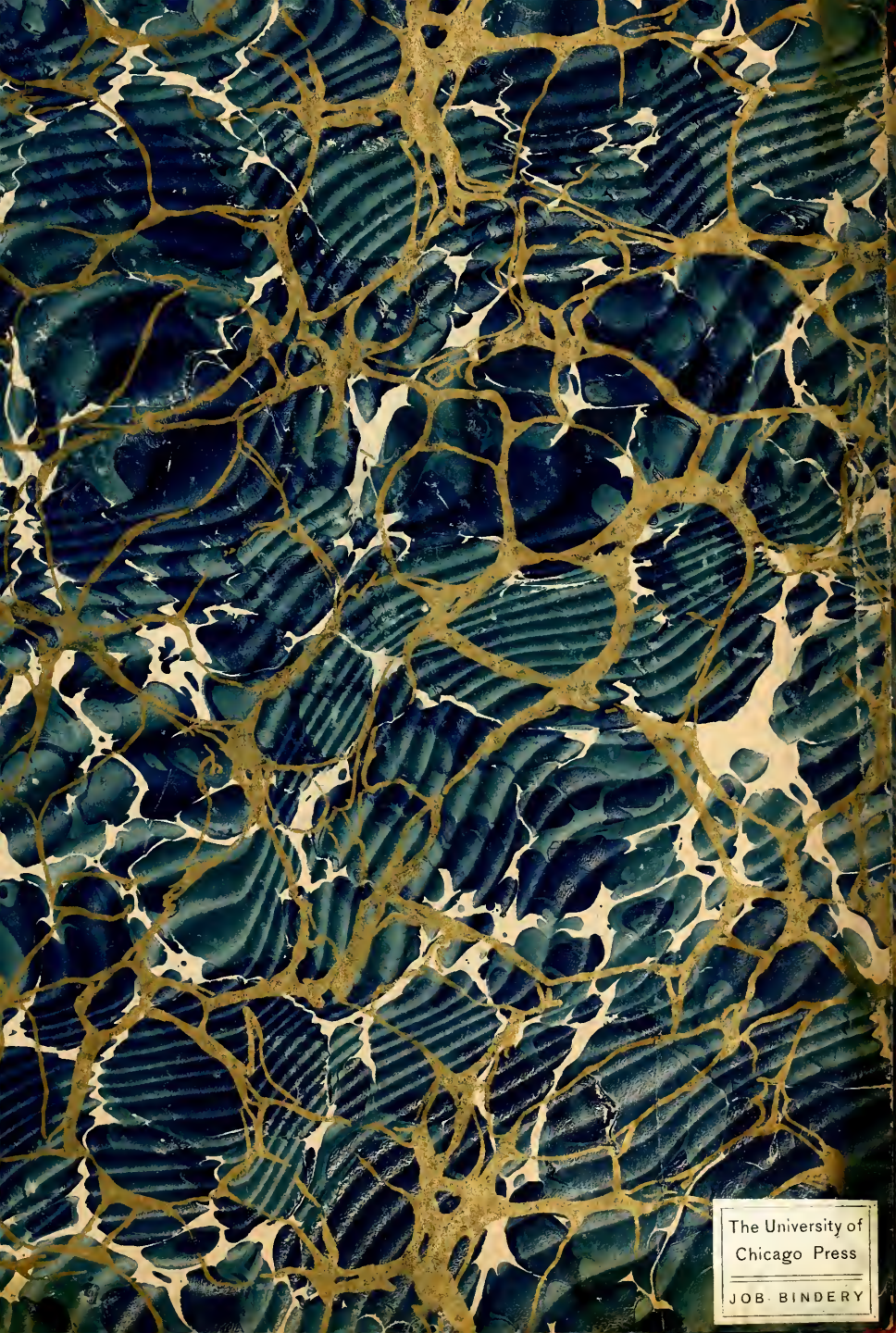
Constructive Work in Paper for Primary Grades, by Julia C. Cremins. Reprint from the *New York Teachers Magazine*, 142 Fifth ave., New York City.

The Manual Training Schedule. Suggested Course of Instruction in Drawing and Constructive Work, by Dr. James P. Haney, Supervisor of Manual Training, New York City.

Decoration of Schools and School Rooms, by Dr. James P. Haney. Reprint from *Municipal Affairs*, New York City.

Report on the Vacation Schools and Playgrounds, New York City. Board of Education.

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